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Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—PHYSIOLOGICAL PAPERS. No. III.—*Comparative Observations on the Physiological Action of Chloral and Bromal Hydrates, and Iodoform.*[1] By JOHN G. M'KENDRICK, M.D., Physiological Laboratory, University of Edinburgh.

CHLORINE, bromine, and iodine present many analogies, both in their uncombined state and in the compounds they form with other elements. For the purposes of this inquiry, I need to specify only one of these analogies, namely, that they are capable of replacing hydrogen from many organic compounds in which that element exists, forming substances which correspond in composition with the original body, but in which one or more atoms of the chlorine, bromine, and iodine have taken the place of an equal number of atoms of hydrogen.[2] Thus, when chlorine gas is passed into absolute alcohol ($C_2 H_6 O$), the alcohol is first converted into aldehyde by losing two atoms of hydrogen, and in this compound ($C_2 H_4 O$), three of the atoms of hydrogen are replaced by three atoms of chlorine, forming a substance, $C_2 H Cl_3 O$, termed trichloracetyl, or chloral. In the same manner, by the action of bromine on alcohol, an analogous compound, bromal, is formed; but there appears to be great doubt among chemists as to the existence of any corresponding substance produced by the action of iodine on alcohol.[3]

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[1] Read before the Medico-Chirurgical Society of Edinburgh, 3d June 1874.

[2] Miller's Chemistry, vol. ii. p. 157.

[3] Watts's Dictionary of Chemistry, article "Jodal," vol. iii. p. 280.

Hydrate of chloral, for many years a chemical curiosity, is now a valuable member of the *materia medica ;* hydrate of bromal is less known ; iodal in any form is not to be obtained. The physiological action of hydrate of chloral has been investigated by many competent observers, and is now well known. This substance has attracted so much attention from chemists, physiologists, and physicians, that its bibliography has become very voluminous. So far as I am aware, the action of hydrate of bromal has been examined by only three observers, Rabuteau[1] of Paris, Steinauer[2] of Berlin, and Dougall[3] of Glasgow.[4] Iodal has received attention from only one, Rabuteau, who, in the paper just quoted, describes experiments made with this substance. As he does not mention how the iodal was prepared, and as many chemists have a doubt as to its very existence, it is not improbable that Rabuteau may not have experimented really with iodal, but with some other product of the action of iodine on alcohol. At the same time, it is to be noted that the symptoms he describes as following the introduction into the system of the substance he employed, are very similar to those produced by the introduction of iodoform, which is readily formed by the action of potash on the compound described by various chemists as iodal,[5] in a way analogous to the action of potash on chloral, and bromal, converting these into chloroform and bromoform and formiate of potash respectively.

Bromal hydrate has been specially studied in this investigation, and its action has been compared with that of chloral, with which all are acquainted, and with iodoform, in the absence of iodal, which substance could not be got. The experiments were made chiefly on rabbits, but a few were made on frogs.

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[1] Rabuteau, Note sur trois Anesthesiques nouveaux, le Bromoforme, le Bromal, et l'Iodal. Gaz. Hebdom. de Méd. 43, p. 681.

[2] Steinauer, Ueber Darstellung des Bromal Hydrats und dessen Einwirkung auf den thierischen Organismus. Ber. der Deutsch. chem. Gesellschaft zu Berlin, 18, p. 645, et Repertor für Pharm. xix. 1, p. 55. Reported in Jahresbericht über die Leistungen und Forschritte in der Gesammten Medicin. Berlin, 1870, I. p. 345 ; also, Ueber das Bromalhydrat und seine Wirkung auf den thierischen und menschlichen organismus, Archiv. für Pathol. Anat. Bd. L. Heft 2, p. 235; also, Discussion über einen Vortrag Steinauer's im Berliner Physiologischen Verein, Berlin. Klin. Wochenschrift, xvii. p. 209. Reported in Jahresbericht, *ut sup.* Berlin, 1871, I. p. 345.

[3] Dougall on Bromal Hydrate, Glasgow Medical Journal, November, p 34.

[4] Since writing this paper, I have observed that Dr B. W. Richardson has experimented with bromal hydrate. He briefly states the general results in his interesting "Report on the Physiological Action of Organic Chemical Compounds," published in the "Report of the 41st Meeting of the British Association for the Advancement of Science, held at Edinburgh in August 1871," pp. 150-1. Dr R. agrees on the whole with Steinauer and Dougall, but he does not profess to give a systematic analysis of the physiological effects of the substance.

[5] Aimé, Annal. ch. Phys. [2] lxiv. 217 ; Watts's Dictionary, art. Iodal, vol. iii. p. 280.

I.—GENERAL DESCRIPTION OF THE ACTION OF BROMAL HYDRATE ON RABBITS.

The subcutaneous injection of three grains of bromal hydrate produces the following effects on a rabbit of three or four pounds weight. During the first three or four minutes, nothing is observed. The animal then becomes restless, and moves about quickly; rubs its nose with its fore-feet; the vessels in the ear become dilated and full of blood; the pupil contracts quickly, but at an equal rate, from its original diameter before injection of 6 mm. or 7 mm. to 1 mm.—that is, to its maximum amount of contraction; in one or two minutes more, the bloodvessels of the conjunctivæ, more especially on the inner surface of the lids, are injected, and there is great excess of lachrymal secretion; the mucous membrane of the mouth and nostrils also becomes red, and a profuse secretion pours from the mouth. The amount of secretion is often so great as to endanger the life of the animal from suffocation, and it may be collected easily in a watch-glass. It is a whitish milky fluid to the naked eye. The microscope (× 250 or 300) shows numerous refractive globules of various sizes resembling globules in milk. There are no epithelial or salivary cells. The respirations become gradually more rapid until they are nearly double their normal amount. The cardiac pulsations are in the first instance diminished in number, afterwards they become more rapid, and they may become double the normal number. Towards the period of death, they are much reduced both in number and in force. The animal then lies flat on its abdomen and chest, with the fore and hind limbs in spread-eagle fashion. There is paralysis of both fore and hind extremities. There is no hyperæsthesia so far as can be determined by pinching, or by weak induction currents. In a few minutes more, the head sinks on the table, the respirations become slower and more laboured, the heart beats less rapidly and more feebly; muscular twitchings are seen, and after a few clonic spasms, the animal dies—frequently in a state of opisthotonos. This is a general picture of the action of a minimum lethal dose which kills in from one to two hours. With a larger dose, the symptoms are more intense. The animal becomes much excited, the pupil contracts with great rapidity to its smallest diameter, and after screaming for a few seconds as if in great pain, it dies in convulsions. With a smaller dose, the phenomena just noticed follow consecutively, but the symptoms are less acute, and after a period of stupor, the rabbit may recover.

A *post-mortem* examination made immediately after somatic death usually shows the following facts: (1.) The heart is still pulsating, though feebly; (2.) There is fluid in the pericardial sac; (3.) The heart is nearly in a state of diastole and cannot contract to its full extent; many of the cardiac vessels are full of blood; (4.) There are numerous ecchymosed spots on the surface of the heart, more especially on the back of the ventricles; (5.) The lungs are congested in patches, and there is frequently fluid in the pleura; the bronchial tubes and trachea are gorged with a white frothy fluid; (6.) The veins in the mesentery are intensely congested, and there is fluid in the peritoneum; (7.) The mucous membrane of the alimentary canal, more especially in the ileum, is more congested than normal; (8.) The venous sinuses of the *dura mater* and the vessels on the surface of the brain are filled with dark blood; the brain substance itself appears to the naked eye to be ex-sanguine; (9.) The blood has its normal colour; (10.) The urine is clear, free from albumen and sugar, and apparently normal.

II.—SPECIAL ANALYSIS OF EACH GROUP OF SYMPTOMS.

1. *Action on the Nervous System.*

The preliminary excit ment evidently indicates either (1.) a specific stimulant action on the substance of the cerebral hemispheres, or (2.) an action on various organs or physiological systems, giving rise, on transmission to the cerebrum, to sensations of uneasiness or pain; or (3.) a combination of both of these physiological states. My impression is, that the latter is the more probable condition. A dose of five grains produces great distress within four or five minutes. The animal is excited and appears to suffer acute pain. This condition is coincident in time with the contraction of the pupil and the dilatation of the bloodvessels. During the first four or five minutes, the animal is quite able to run or leap; but at the end of that period there is staggering, and very soon the power of voluntary movement is lost. The cerebral hemispheres are evidently first affected. The action passes downwards to the base of the brain, and ultimately to the spinal cord. When the cord has been involved, severe convulsions ensue. During the paralytic condition, the nerves are still sensitive to very weak induction currents. Their sensibility and conducting power appear to be intact. The action is therefore on the cerebral and spinal centres, not on the peripheral terminations of the nerves.

2. *Action on the Pupil.*

The pupil becomes rapidly and strongly contracted. The contraction goes on with uniformity, and after the minimum size has been reached, the pupil may remain in this condition for three or four hours after a non-lethal dose. The contraction is coincident in point of time with the dilatation of the bloodvessels, and the diminution of the cardiac pulsations. This would appear to indicate, first, irritation, and, secondly, partial paralysis of the sympathetic nerve, which governs the radiating fibres of the iris. The circular fibres, under the influence of the third cranial nerve, being unopposed, contract the pupil. The amount of contraction is, however, much greater than what can be obtained by cutting the sympathetic nerve in the neck. From this I infer, that not only is the sympathetic nerve partially, or even wholly paralyzed, but there is probably also irritation of the cranial origin of the third nerve. The amount of contraction is greatest after a large dose, and is also most marked during the period of clonic spasms. The vessels of the iris also become engorged with blood. This fact may also assist in explaining the extreme contraction of the pupil.

3. *Action on the Bloodvessels.*

The bloodvessels, as seen in the ear of a rabbit, or in the web or mesentery of a frog, are first slightly contracted. Afterwards they become widely dilated. The first indication of recovery from a non-lethal dose is gradual contraction of the vessels. These phenomena also indicate irritation and afterwards paralysis of the sympathetic nerve. The effects are similar to those produced in the ear of the rabbit by cutting the sympathetic nerve in the neck, or in the web of a frog after division of the sciatic nerve. It was also observed on irritating the sympathetic in the neck of a rabbit under the influence of bromal hydrate with a very weak Faradic current that the bloodvessels in the ear contracted to their normal calibre. This experiment showed that the nerve still retained sensibility and conductivity, and hence I infer the bromal acts on the vaso-motor centre in the *medulla oblongata.*

4. *Action on the Heart.*

The heart's action is at first somewhat slower than normal. This condition continues only for a very few minutes, and is succeeded by increased action with respect to both force and frequence. This state may be again succeeded by a period of diminished action. There appear to be two distinct effects on the heart, according as the dose is small or large. A very small dose, say one grain to a rabbit 4 lbs. in weight, causes slightly diminished action. If another grain be introduced about ten minutes after the first, the action is still further diminished, while almost invariably a third grain introduced ten minutes later causes slight acceleration, soon followed by diminished action. A lethal dose given in this way, in parts, at intervals of ten minutes, slowly weakens the action of the heart, and the animal dies of syncope. On the other hand, a large dose, say four grains to a rabbit of 4 lbs. weight, causes violent action of the heart, with no apparent depression; and if death speedily ensue, the heart presents the following appearances:—Auricles still pulsating and full of dark blood; ventricles motionless—the right being usually widely dilated, and the left in a state of firm contraction. The vessels of the heart are much congested, and there are frequently ecchymosed spots on the surface. There is usually fluid in the pericardium, and in one case there was an effusion of blood. On stimulating gently the sympathetic in the neck, the heart beats more vigorously; and if a small puncture be made into the right auricle so as to permit of the escape of a little blood, the action for a few minutes becomes almost normal. On stimulating the sympathetic, it was also observed that the vessels on the wall of the heart contracted. From these facts, it would appear, therefore, that bromal hydrate paralyzes the heart by interfering with the action of the sympathetic. I was unable to trace any action on the pneumogastric nerve. With the view of discovering whether bromal hydrate may act on the intrinsic ganglia of the heart, the heart of a frog was fed, according to Coat's method, with serum containing two per cent. of bromal hydrate. The effect was to increase the activity to a very slight extent. Serum containing ten per cent. of bromal hydrate stopped the contractions within two minutes.

5. *Action on the Glandular Structures.*

The excessive secretion from every mucous and serous surface is one of the most noticeable of the effects of bromal hydrate. The action of the salivary glands is much increased. The secretion may occasionally be seen welling out of the duct, and is sometimes so profuse as to threaten the life of the animal by asphyxia. Four grains subcutaneously injected into a cat produced a very copious flow of clear limpid saliva, containing the usual salivary elements. As has been well established by the researches of Ludwig, Pflüger, Heidenhain, and others, each salivary gland is supplied with at least three sets of nervous filaments. For example, the submaxillary gland receives filament from the facial directly, from the sympathetic and from the *chorda tympani*. Irritation of the *chorda tympani* produces, so far as the submaxillary gland is concerned, dilatation of vessels, increased flow of blood, and a large amount of clear, watery fluid. Irritation of the sympathetic, on the contrary, causes contraction of the vessels, diminished flow of blood, and a scanty viscid secretion. My impression is that bromal hydrate may cause increased secretion in two ways:—First, by paralyzing the sympathetic filaments; and, second, by irritating the filaments derived from the *chorda tympani*. This view is confirmed by the effects following the injection of atropine, which, as shown by Heidenhain, deprives the *chorda tympani* of its power of excessive secretion, without interfering with its vaso-inhibitory function. The injection of half a grain of atropine during the profuse salivation following the use of bromal hydrate in the rabbit dries the mouth and arrests the secretion within four or five minutes. It is also supported by the fact that the excessive secretion takes place soon after bromal hydrate has been given. If the dose be not soon lethal, the secretion becomes less and less in quantity, until, at the time when the animal is lying powerless and paralyzed, the mouth has only its normal amount of moisture. The inference, therefore, is that when the motor centres are paralyzed, the centre for the facial is in the same condition, and consequently the *chorda tympani* does not act, either as a vaso-inhibitory nerve, or as directly influencing the secretion. I was unable to determine the *rationale* of the action of bromal hydrate on the serous and mucous membranes. Secretion is everywhere increased. The air-passages are frequently filled with a frothy, whitish fluid, and there is always fluid in all the cavities of the body.[1]

III.—COMPARISON BETWEEN THE ACTION OF BROMAL HYDRATE AND CHLORAL HYDRATE.

1. Bromal hydrate is a more active substance physiologically than chloral hydrate. A rabbit weighing 4 lbs. requires about twenty grains of chloral to cause death, whereas four or five grains of bromal would be quite sufficient to kill.

2. Chloral hydrate produces in small doses, or soon after a large dose, marked hyperæsthesia followed by anæsthesia. Bromal hydrate never produces hyperæsthesia, and anæsthesia only when the animal is in such a state of coma that there is no hope of its recovery.

3. Chloral hydrate does not usually produce great contraction of the pupil. Bromal hydrate always does.

4. Chloral hydrate acts chiefly on the cerebral hemispheres, and never, so far as I know, has been known to cause convulsions. Bromal hydrate acts less vigorously on the hemispheres, and more on the ganglia at the base of the brain and on the spinal cord, the animal frequently dying in a state of opisthotonos.

5. After death from chloral hydrate, fluid is rarely found in the shut sacs of the body. In the case of bromal hydrate, fluid is almost invariably found.

6. Chloral hydrate does not usually stimulate the salivary glands to the same extent as bromal hydrate does, but in this instance there are exceptional cases in which chloral hydrate causes excessive secretion of saliva in animals.

IV.—THE ACTION OF IODOFORM.

There is a difficulty in the way of obtaining knowledge of the action of iodoform on account of its want of solubility in any menstruum suitable for subcutaneous injection. It is scarcely soluble in water, acids, or aqueous alkalies, but it is readily soluble in alcohol, ether, and oils, both fixed and volatile. I employed a solution consisting of one grain of iodoform in five grains of alcohol, and fifteen grains of water. The effects were very similar to those produced by chloral, with these exceptions: (1.) There was no period of hyperæsthesia. (2.) There appeared to be a feeling of irritation of the nostrils, as the animals rubbed the nose frequently with the fore-paws. (3.) Ten grains subcutaneously injected into rabbits of 3½ lbs. weight, produced profound sleep for a period of four hours. Twelve grains killed rabbits of the same weight in two and a quarter hours. The lethal dose thus appears to be smaller than in the case of chloral. (4.) There were no convulsions. (5.) The pupils were only slightly contracted. (6.) There was no fluid in the cavities of the body.

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[1] Dr Richardson states in the Report, above quoted, that bromal hydrate (p. 151) "so suddenly and effectually reduces the animal temperature, that the accumulation of fluid in the bronchial canals, from condensation, is a source of positive danger," etc. My impression is, with all deference to this distinguished observer, that this lowering of the temperature, which, to the extent of four or five degrees, undoubtedly happens, is not, at all events, the chief cause of the accumulation of fluid in the bronchial passages, because (1) the fall of temperature, acting on an atmosphere even saturated with aqueous vapour at the temperature of the body, would not account for the amount of fluid found in the lungs; and (2) this accumulation of fluid, in the case of bromal hydrate, takes place even when means are taken, by immersion in a warm bath, to keep up the temperature of the body. From the fact that bromal hydrate causes increased secretion by all mucous surfaces and by all secreting glands, it is almost beyond doubt that the accumulation of white frothy fluid found in the lungs is to be regarded as a secretion or exudation.

Nieszkowski[1] has recommended the use of iodoform in powder as a local agent in the treatment of ulcers of all kinds having fœtid discharges, onychias, fistula in ano, etc. He believes it to act beneficially as a local anæsthetic, and also as a cicatrizing agent. [Dr Matthews Duncan stated in the discussion that, after a trial of this substance, he had found it of no use whatever.]

V.—CONCLUSION.

Whether or not the action of bromal hydrate is to be referred to bromoform produced by its decomposition, as is the opinion of Dougall, or to the formation in the blood of hydrobromic acid, or the liberation of bromine, as is supposed by Steinauer, are questions still open for investigation. I have not advanced farther in this inquiry. In the meantime, while confirming the results arrived at by the most laborious researches of Steinauer and Dougall, I have (1) indicated more specifically the physiological action, and (2) I have shown another example of physiological antagonism.[2]

No. IV.—*Note on a Method of determining the difference in time between the Impulse of the Heart and the Pulse in various Arteries.*

It would be a matter of considerable interest physiologically, to measure the interval of time between the impulse of the heart and the pulse in various arteries. The problem has, no doubt, attracted the attention of many who have practically worked at the subject of the circulation of the blood. At the meeting of the Medico-Chirurgical Society of Edinburgh, held on 3d June, I showed to the members an apparatus which obtains accurate results. At that date, after consulting such works on the pulse as were at hand, I could find no similar apparatus described, nor indeed any apparatus for the purpose; but I stated that the method was so simple that I would be surprised if no one had already thought of it. In an elaborate work on the pulse by Landois,[1] which I have just received, I find that this able physiologist has investigated the matter by an apparatus of essentially the same kind, though differing in certain details. The method consists (1) of mechanical arrangements like the button and lever of a sphygmograph, by means of which the pulse breaks and forms an electric current. The current works (2) an electro-magnet having a rod for the support of a pencil or pen attached to the keeper. The end of this rod is brought into contact with a plate of glass caused to move rapidly, but at a uniform rate, horizontally in front of it, as in Du-Bois-Reymond's spring-myographion, or the end of the rod may be caused to mark on a cylinder moving with great velocity. The rate of movement of the plate of glass or of the cylinder may be accurately timed by the vibration curves of a tuning-fork of known pitch. Two of these electro-magnetic arrangements are fixed firmly to an upright support, one of them being in connexion with the apparatus on the heart, while the other is in electric communication with the apparatus on the pulse.

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[1] Neiszkowski, Essai sur l'Emploi Thérapeutique de l'Iodoform considéré comme Cicatrisant et Anesthesique. Quarto. 42 pp. Paris. Reported in Jahresbericht, I. p. 345, 1870.

[2] The substances used in this inquiry were supplied by Messrs Duncan, Flockhart, & Co., Edinburgh.

If both markers be now brought up so as to touch the cylinder or the glass plate in the same vertical plane, and if both electro-magnets acted simultaneously, it is evident that one of the vertical marks obtained on the recording surface by electro-magnet A, would be exactly over the mark made by electro-magnet B. If, on the other hand, one of the electro-magnets acted an instant of time (the $\frac{1}{1000}$th of a second even) later than the other, the two marks would not be in the same vertical line; but as the glass plate or cylinder must have moved a certain distance between the time of action of electro-magnet A and that of B, the one mark would be a little to the side of the other. The horizontal distance between the two marks expresses therefore the time between the action of the two electro-magnets. With one apparatus on the heart and another on the pulse, the electro-magnet in connexion with the latter acts an instant later than the one in connexion with the former. Thus, minute intervals of time may be accurately measured, as has been done by Landois, and his measurements are recorded in the work above quoted, p. 290 to 303.

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[1] Die Lehre vom Arterienpuls nach eigenen Versuchen und Beobachtungen dargestelt von Dr Leonard Landois, a. o. Professor der Universität, Griefswald. Mit 193 eingedructen Holschnitten. Berlin, Hirschwald, 1872. P. 360. The literature of the subject is given very fully at the end of the book.

ARTICLE II.—*Case of Fibroid of the Uterus, complicating Pregnancy, and proving fatal by Torsion of the Pedicle.* By JAMES CAPPIE, M.D.

(*Read before the Obstetrical Society of Edinburgh, 25th March.*)

As unfortunately I took no notes of the following case at the time of its occurrence, I am only able to detail its history in a general way. But as its termination is, I believe, one very unusual, some account of it, however imperfect, should be placed on record.

Early on the morning of the 7th June last, I visited Mrs G., who supposed herself to be in the fourth month of her first pregnancy. I found she had been slightly ailing for a few days, that on the previous day she had been suffering some abdominal pain, and had repeatedly fainted, and that during the night pain had become constant and severe, with feelings of great tension and sickness. She had an anxious expression, and was unable to rest in any position. There was no fever. The abdomen was greatly distended, and so tender that the lightest pressure could not be borne. I could only ascertain that the distension was not of a tympanitic character. Fomentations were ordered, and I gave her a full opiate. During the day she was a little easier, but still intolerant of pressure. Next morning the sickness, sleeplessness, and anxiety continued. There had been a slight sanguineous discharge from the vagina, but the os uteri had no tendency to open. The tenderness had sufficiently lessened to allow pressure to be made over the abdomen, and I now found that the whole cavity was occupied by a firm swelling, resembling the uterus at the full term of gestation.

On inquiry I found that neither the patient nor any of her friends had the least suspicion that she was affected with an internal tumour; and as it so happened I had attended her husband during an attack of typhoid fever so lately as the previous March and April, I was myself aware that at that time her appearance would not have led any one to suspect its existence. I came to the conclusion, therefore, that the swelling had been caused by internal hæmorrhage. This view seemed confirmed by the circumstance that a few weeks previously she had fallen on the floor, coming down heavily on her buttocks. Although she did not feel the worse for the accident at the time, she had since then become disinclined for exertion, and had become subject to faintings. For a short time before I saw her, she had been noticed to appear languid and easily fatigued, and on coming up the stair she had to sit down for a time to recover herself; but these symptoms were ascribed to her pregnant condition. Her general state of health had previously been good. She had been able to act as her husband's nurse during the whole of the illness just mentioned. The swelling was neither so hard nor so nodulated as would be expected if the uterus were filled with clots; but, on the other hand, I could not suppose any other solid sort of tumour could have sprung up with the mushroom-like rapidity that apparently had occurred in the present case. I therefore determined to lose no time in emptying the uterus. As the os uteri was within easy reach, I was able to force the point of the finger within it and to get it dilated to a slight extent. I then ruptured the membranes, and gave repeated doses of ergot. The fœtus was thrown off on the following day, and the placenta came away with ease immediately afterwards. I had made preparations for receiving a collection of clots, but the amount of hæmorrhage was, if anything, less than in an ordinary case. The os uteri showed a disposition to close, and, so far as could be determined with the finger, the uterus seemed empty.

I had therefore to revise my diagnosis, and to entertain the notion that the swelling might be due to the presence of a tumour. As the patient was considerably exhausted, it was certain that in the meantime there was nothing further to do in the way of active interference. She passed a comparatively comfortable night, and in the morning the more urgent symptoms had abated. As the case, however, was an unusual one, and not without anxiety as to what the result might be, I requested Dr Matthews Duncan to see her. He confirmed the view that a uterine tumour existed, but that any attempt to ascertain its exact nature or attachment should be deferred till the patient had rallied.

Although I had been wrong in my diagnosis, the result seemed to show that the treatment was correct. The pain subsided, sleep returned, and the stomach could retain food; the tumour also became lessened in bulk. At first it pressed upwards under the ribs, so that its boundary could not be defined, but after some days it subsided so far that its margin could be made out.

The patient kept in this condition, weak but not suffering, till the 24th of the month, when sickness and pain returned. On the following day these symptoms became urgent, the patient became very restless, and had an anxious, haggard expression. Some opium pills were prescribed, but they gave no relief. In the afternoon the pain amounted to agony, and the distress to absolute misery; she had not a moment's peace. She had urgent thirst, but everything taken on the stomach was at once rejected. In this emergency, and as she had already got several grains of opium, I thought myself warranted in placing her under the influence of chloroform. The relief thus afforded seemed to be great, and when consciousness returned she pleaded with such piteous and persistent earnestness for more chloroform, that its use was continued. She sank on the evening of the 26th, having been kept under chloroform the greater part of the last thirty hours of her life.

A post-mortem examination, which was obtained with difficulty, and performed in most inconvenient circumstances, was kindly conducted by Dr Harris, thirty-six hours after death. Dr Matthews Duncan was also present.

On cutting into the peritoneal cavity, a quantity of fœtid gas escaped with a loud report. When the abdomen was laid open the bowels superiorly were seen to be distended. The large omentum covering the tumour was in some parts almost black in colour, but did not present any obvious signs of inflammation, except slight soft adhesions to the upper part of the uterine tumour. On removing the omentum the bowels were seen to be distended with gas, and to have at many parts, but not uniformly, a red injected appearance. There was no fluid in the peritoneal cavity, nor was any lymph or pus discovered.

The lower part of the abdomen was filled by a nearly globular tumour, which, on being afterwards measured, was found to be 24 inches in circumference.[1] It was of a livid dark brown, almost black colour, and had the appearance of being decomposed. To ascertain its attachment it was carefully raised, and Dr Duncan then noticed that the pedicle by which it was attached near the upper right angle of the uterus had become twisted. To examine this condition more minutely the fundus uteri was cut away, every care being taken to preserve the relative position of the parts. The twisting of the pedicle could easily be seen. It was found to have been turned round 1½ times, the direction being from left forwards to right. The pedicle itself was small, not so thick as the little finger, and appeared to be composed of vessels and peritoneum. When untwisted it was found to be potentially tubular, the separation of its walls forming a small cavity.

When the tumour was cut into it was found to be a sub-peritoneal fibroid. Its section had uniformly throughout a deep purplish-red flesh colour. From its cut surface air was seen to escape in numerous minute bullæ. The uterus itself appeared to be healthy.[2]

This case presents several points of interest, but unfortunately we have not sufficiently precise data to enable us to come to a definite conclusion about them. The first remarkable feature is the rapid development of the tumour. It appears something extraordinary that the abdomen could have become so largely filled with a hard swelling, without either the patient or any of her friends being aware that there was anything unusual about her. As she was rather small and sparely built, any increase of size could less easily escape notice; yet, as I have already said, I could myself testify that less than two months previous to the time I was sent for, her appearance was not such as to draw attention to her condition. The most probable explanation is, that after the twist on the pedicle had occurred, the circulation through the tumour would be interfered with, and that while the blood was still permitted to enter by the arterial vessels, its return by the veins was impeded. When the tumour was at its fullest, therefore, the bulk would to some extent depend on venous and serous engorgement. This view is confirmed by the circumstance, that before the patient's death the size of the tumour had become decidedly less.

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[1] Before the measurement was taken, however, the tumour had become comparatively flaccid from the draining away of serous fluid.

[2] I am indebted to Dr Duncan for the use of the notes which he made at the post-mortem examination.

The principal interest, however, is in the fact of strangulation and death taking place in the tumour. This is a termination not referred to in systematic works on diseases of the uterus. I am not aware indeed whether it has previously been observed. It is impossible to be certain as to when the twist occurred in the pedicle; but as the patient was inclined to date the beginning of all her ailment from the fall previously mentioned, which was not more than three or four weeks before the time I was sent for, it is not improbable that torsion of the pedicle resulted from that accident. As we have seen, the first effect was to cause a rapid and great increase in the bulk of the tumour; but afterwards, the circulation of blood being completely checked, loss of vitality would necessarily ensue. The great distress of the last two days of the patient's life may have been partly caused by septic poisoning; but as there was no delirium, and as the temperature never rose to 100°, the local irritation of the putrefying mass must have been the principal immediate cause of the intense pain.

In regard to the administration of chloroform, I rather think that the patient's life was prolonged some hours by this means; but even if it may have had some effect in hastening her death, I would not hesitate in the same, or in like hopeless circumstances, to adopt the same mode of affording relief. If means to induce "euthanasia" with medicine are ever lawful, it must be where there is such a combination of overpowering agony with surely and speedily fatal conditions, as were found in the present case.

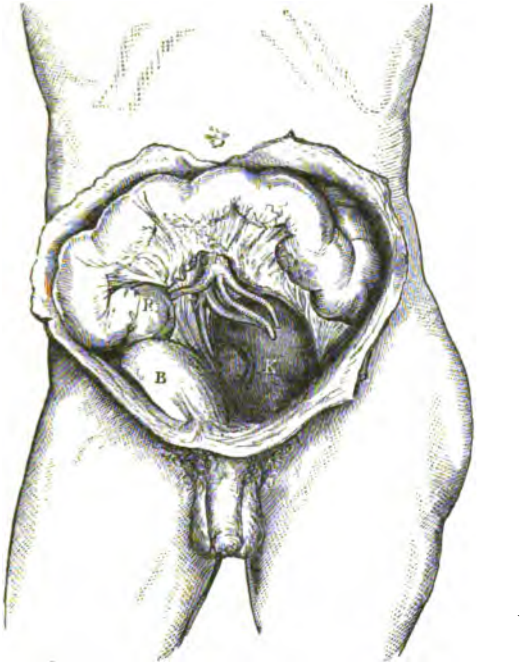
ARTICLE III.—*Notes on Congenital Absence of the Kidney.* By M. WATSON, M.D., Demonstrator of Anatomy, University, Edinburgh.

CASES of mal-position of the renal organ of one side, with congenital absence or atrophy of that of the opposite side of the body, seem to be sufficiently rare to justify the publication of the present cases. For liberty to examine the first, I am indebted to the kindness of my friend Dr Chiene. On opening the abdominal cavity, which was that of an adult male, the first thing that attracted attention was an unusual arrangement of the great intestine as well as of its peritoneal investment. The cæcum was situated rather above the usual position, in the right lumbar region, and in close relation to the vertebral column. The ascending, transverse, and descending colons, were arranged in the usual manner, the latter passing down as far as the left lumbar region. Here the intestine turned to the right, across the abdominal cavity, so as to gain the right lumbar region, where it lay immediately beneath the cæcum, to which it was attached by several adhesions. It then descended into the pelvis, crossing in its course the common and external iliac arteries of the right side, to become continuous with the rectum, which extended along the front of the sacrum and terminated at the anus in the usual manner. The peritoneum investing the ascending, transverse, and descending colons, was arranged in the usual manner, whilst the second or lower transverse flexure was provided with a well-developed meso-colon attached to the posterior abdominal wall, and of such extent as to admit of great freedom of movement of that portion of the gut within the abdominal cavity. There was thus an additional transverse meso-colon situated *below* the attachment of the mesentery, in a manner similar to that in which the usual meso-colon is placed *above* that fold, and between these two duplicatures of the serous membrane were situated the coils of the small intestine. The other portions of the alimentary canal, with the associated glands, were normal. The arteries supplying them were also distributed in the usual manner, the inferior transverse colon, along with the rectum, being supplied by the inferior mesenteric artery. This transposition of the rectum to the right side would not appear to be very uncommon, as I have observed two cases of this kind in the anatomical rooms of the University during the past session. Ellis[1] also refers to three cases which came under his observation.

Passing now to the examination of the urinary organs, the right kidney as well as its duct were entirely absent, nor was there any trace of the latter at the normal point of entrance into the bladder, the vesical mucous membrane being uniformly smooth and presenting no indication of any perforation. The left kidney, which was not larger than usual, was circular in form and lobulated on the surface. It was situated close to the brim of the pelvis, in front of the common and external iliac arteries of that side, with which it was in contact. Its duct, which was enlarged at the hilus, so as at first sight to resemble a cyst, gradually narrowed, but continued to be of greater calibre than usual throughout its course, except at the point of entrance into the bladder, where it assumed the normal size. The latter viscus, when injected with water, rose above the brim of the pelvis, and was forced to the right by reason of the unusual position of the left kidney. The left renal artery came off from the point of bifurcation of the aorta. It passed obliquely downward and outward, resting on the front of the left common iliac artery, and entered the upper extremity of the kidney, having previously divided into two branches. The prostate gland and testicles were normal. Unfortunately, by reason of

[1] Demonstrations of Anatomy.

the age of the specimen, the vesiculæ seminales could not be satisfactorily examined.



A, Aorta; B, Bladder; K, Kidney; R, Rectum; V, Vena cava.

For the second case of congenital deficiency of the kidney of one side which has come under my notice, I am indebted to Dr Howden, Superintendent of Sunnyside Asylum. It occurred in the body of an an adult male patient who was the subject of epileptic attacks. The left kidney was larger than usual, weighing 9½ ounces, whilst that of the right side was reduced to the size of a large bean, measuring an inch and a half in length, and one inch in greatest breadth. It was situated in the usual position. On making sections of the atrophied organ, there was no trace visible to the naked eye of any subdivision of its substance into cortical and medullary. When submitted to the microscope, the great bulk of the body was seen to be composed of dense fibrous or connective tissue, though here and there were to be detected isolated tubes of very much larger calibre than the ordinary renal tubules. These were filled with cells, and at some places were connected with what appeared to be well-developed Malpighian capsules. The latter, however, were rarely to be seen. The persistence of these tubes to so late a period, in the midst of a mass of fibrous tissue, was the more remarkable, as their secretion could have had no outlet, inasmuch as the ureter had no connexion whatever with the rudimentary kidney. This tube, although pervious at the point where it entered the bladder, degenerated into a fibrous cord in the neighbourhood of the kidney, and was lost in the loose subperitoneal connective tissue before reaching the atrophied organ.

If now we compare the cases just detailed with others of a similar kind which have been put on record, seven of which I have collected from the Transactions of the Pathological Society of London,[1] and one in Henle and Pfeufer's Zeitschrift,[2] we find that of these ten cases, seven of them occurred in males, one in the female, and two in subjects the sex of which is not stated. We may thus in all probability conclude, that congenital deficiency, or absence of the kidney of one side, is more common in the male than in the female. As to whether the right or left kidney is more frequently absent, Dr Duckworth, from a review of seven cases which came under his notice, found that in five of them the left kidney was absent, and in only two of them the right. Adding to these the other cases to which I have referred, we find the left kidney to be absent in six, whilst the right is absent in four. Were the number of cases multiplied, we should in all probability find the number of these in which the right and left kidneys are absent to be about the same. The lobulated and irregularly circular form of the kidney in the first case, bears out the truth of Meckel's remark, that in those cases in which the kidney is situated in the pelvis, the lobulated fœtal condition of the organ is persistent through life.

There remains to be considered the question whether these cases throw any, and if so what, light on the development of the kidney and ureter. Münchmeyer,[3] in his remarks on the case above referred to, in which there was not only congenital absence of the left kidney, but also of the vas deferens, vesicula seminalis, and ejaculatory duct of the same side, advocates strongly the view adopted by Kuppfer from his researches on the sheep and fowl, that the kidney and ureter are developed as distinct structures from the first, the latter being produced by an outgrowth from the Wolffian duct of the same side. We would naturally expect that in those cases in which there is a deficiency of those portions of the generative system which are produced by transformations of this duct, there would be a corresponding arrest of development of similar portions of the renal system, and *vice versa*. And this holds true of the case in question. In opposition to this as a general rule, however, must be stated, *firstly*, That in none of the nine cases above referred to is there any mention of abnormal development of any part of the sexual apparatus, and this would surely have been noted had it occurred; and, *secondly*, That upon analysis of these cases, we find that in five of them there was no trace of a ureter; in two of them the ureter was connected with the bladder alone; and in one it was connected with the kidney alone, which in this case "was a mere rudiment." We come therefore to the conclusion, that in the majority of those cases in which the kidney is absent, the corresponding ureter is also absent; that in those in which a rudimentary kidney is present, the ureter may be developed in connexion with it, being deficient *below*; or, *lastly*, that a portion of a ureter may be developed in connexion with the bladder, being deficient *above*. These facts harmonize better with Valentin's view, as quoted by Quain[1]—"That the ureter, the pelvis of the kidney, and the uriniferous tubules are formed in a general blastema, independently of one another"—than with any other. It is in complete accordance with this view, that where this blastema is congenitally absent or incapable of farther differentiation, there we should have complete absence of both kidney and ureter; but should this blastema be present, it is possible that one or other portions of it may proceed to greater development, whilst the rest remains stationary, and thus we may account for the presence of one or other portions of the tube of the ureter, whilst in the remainder of its course it is altogether deficient.

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[1] Vols. i., iii., x., xv., xvii., xx.

[2] Dritte Reihe, Bd. xxxiii.

[3] Henle and Pfeufer's Zeitschrift.

ARTICLE IV.—*Case of Poisoning by the Inhalation of Coal-Gas.*

By WILLIAM TAYLOR, M.D.

(*Read before the Medico-Chirurgical Society of Edinburgh, 1st April.*)

AT half-past ten o'clock on the morning of Saturday, the 7th of June 1873, I was sent for in great haste to attend, at one of the hotels in town, a gentleman who had slept there overnight, and who was supposed to be dying from the effects of the inhalation of coal-gas which had been escaping in his room from an open burner during the whole or part of the night.

The smell of gas had first been perceived by one of the housemaids when going round to open the windows shortly after ten o'clock in the morning. She immediately informed the head waiter, who, in trying to find out the source of escape, entered an unoccupied room where the gas was still burning low, as it had been during the night, and where there was a strong smell of gas. This he then traced to the door of the adjoining room, which was occupied by the visitor in question. The waiter placed his nose to the keyhole, but failing to perceive an escape there, he pressed inwards the upper portion of the door, which being thin yielded, and through the partial slit so formed a strong odour of gas emanated. The door being bolted, he tried by means of loud knocking to rouse the sleeper. On receiving no response, he looked through the keyhole into the room, saw the naked feet of the inmate stretched motionless over the edge of the bed, and from their blanched and lifeless look concluded that death had taken place. He then called the "boots" and one or two gentlemen, and with their assistance forced open the door, entered the room, found the occupant lying on his back unconscious, his mouth widely open, and his breathing audible, with a subdued stertor.

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[1] Quain's Anatomy, seventh edition.

After vainly trying to rouse him, he proceeded to open the window of the room and those of the adjoining rooms. When the current of air reached the sleeper, his teeth became firmly clenched, and his lips tightly closed over them. The breathing was then less free than formerly, and immediate suffocation seemed inevitable. The waiter went upon the bed and tried forcibly to open the jaws. While he was in the act of doing so I entered the room.

The patient, a full-bodied muscular man, aged from fifty to sixty, was lying on his back diagonally across the bed, in a corner of the room. His head was towards the wall, and his feet protruded obliquely from the side of the bed. He was deeply comatose. The face, neck, and upper part of the forehead were congested and livid, the purple of the forehead forming a broad band, which deepened over the eyebrows and shaded off towards the scalp, which was natural in colour. His eyes were half closed, the pupils insensible and partially dilated, his teeth firmly clenched, his breathing laboured, fluctuating, interrupted, and the breath strongly impregnated with gas. The arms were semi-flexed in front of the body, the hands resting on the abdomen, which was neither hard nor distended; the body was cold and feebly rigid, the pulse almost imperceptible, and the whole appearance betokened speedy dissolution, reminding one very much of the appearances presented when a patient is dying from the effects of an overdose of chloroform.

Although the window and door of the apartment were wide open, and a fresh breeze passing through them, the air was loaded with gas, and my first step in treatment was to have the patient removed to a larger room, and placed on a bed with his head near an open window. I dashed cold water on his face, slapped his chest vigorously with a wet towel, and, after repeated efforts, with difficulty forced open the jaws and drew forward the tongue, a process which would have been even more difficult but for the presence of two well-worn lateral indentations between the teeth produced by the stem of a tobacco-pipe. I then proceeded, with the waiter and one or two gentlemen in turn, to aid the enfeebled breathing by the employment of artificial respiration, according to the method of Marshall Hall. Once or twice during these efforts the breathing entirely ceased, the patient being apparently convulsed; but we carefully kept up the movement to the rhythm of the suspended respirations, and the breathing was resumed by a deep but feeble gasp. At intervals the chest and face were slapped with a wet towel, which latterly seemed to awaken a faint response.

At this time I observed with delight that the eyes were closed, and on raising the lids shortly afterwards, the pupils proved sensitive to the stimulus of light.

Meantime I had sent for Professor Maclagan, but the messenger having returned with the intelligence that he was out of town, I at once despatched him for Professor Sanders. Shortly before his arrival, Dr Coghill, who had heard of my situation, kindly came in and rendered me all the assistance in his power. At his suggestion, and with his help, sinapisms were applied to the abdomen and calves. By this time the breathing was moderately re-established, but was still subject to fluctuation, and at times became very low and halting, so that we had to watch it closely, and had frequently to resume the artificial respiration. The intervals of rest were now sufficiently lengthened to allow of the application of hot bottles to the feet, hands, and legs, and a stimulating enema of turpentine, ammonia, etc., was administered by Dr Coghill. The enema was retained, but no marked change followed its use, and the sinapisms produced almost no effect on the skin. Under the combined influences of the several agencies, however, the temperature of the body seemed at length to be permanently re-established; still no sign of returning consciousness appeared; the jaws retained their rigidity, the teeth making deep indentations in the wooden gags which were employed to keep them apart. These were used alternately at either side of the mouth, so as not to encroach on the air-passage in front. The opposite cheek on the free side of the mouth was flaccid, and flapped loosely with every breath. The pupils and conjunctivæ continued sensitive, and the eyeballs were observed to oscillate from side to side with a lateral, or perhaps obliquely lateral, motion. This rolling was as nearly as possible synchronous with the breathing; it was continuous and simultaneous, both eyes moving in the same direction at the same time. It was uninfluenced by the presence or absence of light, and was unvarying in its regularity, whether the eyelids were open or closed.

The breath was still strongly impregnated with gas, and the tongue, which had become very dry, was, at the suggestion of Professor Sanders, kept moistened by an occasional drop of water, so as to prevent the tendency to reflex retraction. Shortly before twelve o'clock Professor Sanders left, and immediately sent down from the Infirmary Messrs Murray and M'Leod, advanced students of medicine, who remained with me, and were of great service. They relieved the laymen from their occasional duties in connection with artificial respiration, and in the intervals watched the breathing, and relieved me of holding the tongue, which as yet I had never let go. On their arrival, say 12.15, the respirations numbered 16–18 per minute; the pulse was steady, but feeble; the legs, though rigid, were capable of being flexed, and tickling the soles of the feet produced the normal reflex phenomena.

At half-past one, Professor Maclagan arrived. He suggested the sitting posture, dashing cold water on the chest, and the induction of vomiting by tickling the fauces with a long feather. These suggestions were with his assistance at once carried out. The erect position was maintained with great difficulty, from the utter helplessness of the patient, and had soon to be abandoned. The cold affusion produced no evident improvement; and although the tickling of the fauces was not followed by any attempt at vomiting, it had other advantages, for every time the feather was introduced it came away loaded with glairy, pinkish, sero-sanguineous discharge, the source of which seemed almost inexhaustible. The presence of this was thus timeously discovered, for otherwise it might soon have accumulated, to the great detriment of respiration, and there were no external appearances about the mouth to indicate its existence. Nothing larger than a feather could be passed, owing to the continued rigidity of the jaws.

2.30 P.M.—Professor Sanders returned. Pulse 72–75; less regular; intermissions occasionally as often as 1 in 4; fluffing of cheeks very marked; bladder emptied per catheter; urine in good quantity; colour and consistency normal; no odour of gas; the bladder semi-paralyzed, the better half of its contents having been ejected by pressure on the abdomen. Enema given of beef-tea, 10 oz., and brandy, 1 oz. Shortly afterwards, the patient broke out in profuse perspiration, which had a gaseous odour. The pulse began to improve, and the respiration increased in rapidity until a quarter to four o'clock, at which time I left the case in charge of Messrs Murray and M'Leod. Professor Maclagan, who called shortly afterwards, has kindly supplied me with the following notes:—

"4 P.M.—Patient looked worse (than at 1.30). Coma profound; forehead livid; mucous râles at bases of lungs; sweating copiously, sweat smells of gas; yellow-tinged froth collected at mouth; pulse 78, soft."

About half-past five I returned, and for the first time released the tongue, which was much swollen, and although liberated from the grasp of the forceps, continued to protrude, as if powerless to retract. As the air began to feel chilly, I closed the window beside which patient lay, and partially closed the other. The mucous rattle in the throat had increased, and we therefore placed the patient on his side, with his face inclined downwards over the end of the pillow. This led to a copious drainage from the mouth. The rattle in the throat ceased, and the breathing was much relieved. Pulse 96; respirations 28; skin dry. Mr Murray informed me that Professor Maclagan at his last visit had recommended an enema of hot coffee and brandy, as a stimulant to the nervous system. This we accordingly administered. It was not retained, and its ejection was accompanied with a fæcal evacuation. There were occasional but slight convulsive indications.

At 6.30 Professor Sanders returned. He thought the condition of patient worse than at previous visit. We gave a second enema of beef-tea and brandy, after which perspiration was re-established. The breath still smelt strongly of gas. Tongue still protruding, but moist, and less œdematous. We next tried the effects of a strong interrupted galvanic current. This seemed to exert a beneficial influence. The patient appeared sensibly roused, and when the galvanism was applied to either hand, thereby traversing the muscles of the arms and chest, the breathing was perceptibly stimulated. The current was varied in intensity, and when it reached its acme, the arms were firmly flexed, and the patient uttered a responsive groan. Galvanism was also applied to lower extremity, first to the popliteal space and sole of the foot on either side, and next to the sole of either foot. The left side was found to be less sensitive than the right. A similar condition was observed in the upper extremity, and was manifested, not only by a readier response to the stimulus, but a more enduring sensibility to its effects, for the right arm continued flexed, and the left flaccid, long after the galvanic action had ceased. Mr Murray also observed that the right conjunctiva was more sensitive than the left. Later in the evening, we injected cold water into the ear, in order to rouse the patient, but without effect. Up to 11 o'clock there was no change to record, except that the eyes were once or twice opened as if by voluntary effort. About this time Professor Sanders returned. Patient quiet, breathing freely, and requiring no attention. Discharge from mouth continues; breath perceptibly purer. The convulsions, which were foreshadowed in an early part of the day, and which occasionally manifested themselves during the afternoon and evening, now began to be more frequent and perceptible. These affected the trunk and limbs only, not the head or face. A third enema of brandy and beef-tea was given, and bladder emptied by catheter. Urine darker in colour, and smaller in quantity. At 12 P.M. I retired, leaving the patient in charge of Mr Murray, who reports that during the next few hours there was little change.

On Sunday, at 4 A.M., I returned; found the patient considerably improved, better than he had been since the previous morning, with the exception of occasional pauses in the respiration. These seemed the only remaining traces of the convulsions already alluded to. Tongue moist, and replaced in mouth; œdema gone; perspiration profuse; pulse 96, full, and of such a character as might be considered natural in a man of his age and temperament. On using a towel to remove some tenacious mucus from the depending side of the mouth, his teeth snapped my finger, and remained closed for about a minute. They afterwards relaxed and opened. This occurred twice to me, and once to Mr Murray, within a few minutes. No smell of gas could be detected in the breath; but it had instead a faint, sickly stomachy fœtor—a term I employ for want of a better.

The patient had quite the expression of being in a profound slumber, the mouth being relaxed, hanging down, and the saliva overflowing it. There was no return of the gurgling in the throat. Administered a fourth beef-and-brandy enema.

At 7 A.M., a prolonged pause in the breathing took place.

At 9.30, Mr Murray, who had been absent since 4 A.M., noticed a decided change for the worse, and was much struck by it. Patient much exhausted. Pulse 112, small, and weak; respirations 48; pupils dilated, and not sensitive to light; skin dry; breathing stertorous.

10.45.—Patient still breathing heavily; respirations 43; pulse 110; sinking. Professor Sanders called. Fifth enema given of beef-tea and brandy. Urine drawn off.

Professor Sanders kindly offered to remain with the patient until I went to make some visits, and ere I returned he was dead. The Professor reports:—"For about twenty minutes after Dr Taylor left, there was no change; but at this time the strength began rapidly to give way. The pulse became much weaker, the breathing slower and more laboured, the face became pale, and on raising the eyelids the pupils were now found dilated. Finally, the pulse at the wrist became imperceptible, and, after a few gasping respirations, the patient expired."

The symptoms throughout bore a strong resemblance to those of apoplexy, and even the copious perspirations had a like fatal import. This we feared at the time, although hopeful of benefit from them on account of their eliminative action. One very marked characteristic in this case, however, was the rapidly fluctuating nature of the conditions which presented themselves. These were alternately encouraging and discouraging—the system at one time striving vigorously to work off the poisonous load, and anon sinking exhausted with the effort. Thus, the periods of hopeful tranquillity, when the pulse was steady and the breathing regular, were always followed by intervals of shorter duration when all these functions were deranged. This explains the apparently conflicting reports which we have made regarding the steady and intermitting character of the pulse; and while, on the one hand, it helped to strengthen our efforts and brighten our prognosis; on the other, it kept awake an unwilling suspicion that all would be in vain.

No individual symptom was more remarkable than the steady and incessant oscillation of the eyeballs. These traversed laterally the extreme area of motion, as if the patient were anxiously looking as far as he could to the right, then as far as he could to the left; and neither light nor darkness, irritation nor repose, nor the internal conditions which governed the varying sensibility of the pupils, seemed in any way to modify the constancy of this motion, or relieve the monotony of its rhythm. Even when once or twice we thought that, by means of the active stimuli employed, [illegible] awakened a slight response, it only took the character of a groan, together with a momentary half-knowing look. The eyeballs never rested.

Unfortunately, there was no post-mortem examination obtained, so that many of the pathological problems which suggested themselves to us must remain unsolved. The arrival, at 11 A.M. on Sunday, of the patient's brother and nephew from Glasgow, tended to clear up certain difficulties, which, apart from the interest of the case, would have rendered such an examination necessary.

Up to the time of their arrival, all that we knew of the patient was, that he had arrived at the hotel on the previous evening, without luggage, had taken a bedroom, and paid for it; had gone out, and must have returned before 11 P.M.; went to his bedroom, situated in an obscure part of the third floor, without being conducted or observed by any one. There was nothing in his pockets to lead to his identification, except the address of a gentleman in Edinburgh, at whose house he had called on the day of his arrival at the hotel, but who did not know his name. His pockets only contained a key and 1s. 2d. in money.

The brother exhibited to us a credential from the Canadian Good Templars, commending his relative to the order in this country. His habits were temperate, and his life well ordered.

There was no room left, therefore, for suspicion regarding intoxication or intended suicide, but every reason to believe that the occurrence was purely accidental. This idea was strengthened by certain other particulars regarding his history He had left this country and settled in Canada some thirty-five years ago. There he had made a competency as a farmer, and retired. Two or three days before we saw him, he had arrived in this country on a two months' pleasure trip. These days he spent with his brother in Glasgow, who had remarked how ignorant his relative was regarding gas, and who, in consequence, would not trust him with turning it off in his own bedroom. He was not, therefore, surprised to hear of the accident. The Canadian had, doubtless, been accustomed to the use of candles or lamps, and unaccustomed to the use of gas, so that, instead of turning it off, he had evidently blown it out, and fallen asleep before the odour became strong enough to be disagreeable.

The quantity of gas inhaled must remain uncertain; but, by means of the data at our disposal, we can arrive at a tolerably close approximation.

The apartment had a window, but no fireplace. Its measurement was 12 × 8 × 10 feet, and its capacity 960 cubic feet. The furniture of the room, and the person of its occupant, would take up, say, 13 cubic feet, so that the available breathing space would be about 947 cubic feet. Into this space the gas entered from a burner which was constructed of such a size as to allow the gas to issue [illegible]m it at the rate of 3 feet per hour. Supposing, then, that the gas was fully turned on, the degree of impregnation of the air in the apartment at the end of the first hour would only be in the proportion of 3 cubic feet of gas to 944 cubic feet of air, or 1 part in 315; and, at the end of the eleventh hour, when the door was forced open, there could only have been 33 feet of gas to 914 cubic feet of air, or 1 part in 27 or 28, even if the whole of the gas had been retained in the apartment. Now, the man was of low stature, say, 5 feet 6 inches, his age between 50 and 60. The measurement of his vital capacity, or the utmost volume of air which his lungs could contain, would be about 214 cubic inches, and the ordinary breathing capacity, say, 128 cubic inches. His respirations during the early part of treatment were about 18 per minute. Suppose we say that during sleep they were 15 per minute. The air used in respiration would be consumed at the rate of 13⅓ cubic feet per minute. The whole available air of the apartment would therefore pass through the lungs in 71 minutes, or rather more than nine times during the eleven hours' exposure.

The air after the first 71 minutes would be very much contaminated with the products of respiration, notwithstanding the fresh supplies obtainable through the chinks in the door and window. During these hours, also, a good quantity of the gas itself would be separated from the apartment by displacement, and by its own diffusive force. Hence the quantity which escaped through the apertures about the door was sufficient to pervade with its disagreeable odour the passages and adjacent unoccupied rooms, and we may suppose that a like quantity made its escape through the window. The proportion of gas remaining in the room must have been thus considerably lessened; and, instead of saying that the proportion was 1 part in 27 or 28, we would probably be nearer the truth were we to reckon it as 1 part in 32 or 33—say, 3 per cent. or under.

This calculation is of great importance, as showing the injurious character of gas when mixed with air in very small proportions, and enables us to appreciate its deadly character when pure. A few weeks ago, a notice appeared in the *Scotsman* illustrative of the latter truth. One of the main pipes had been injured, and the workman, who stooped down to examine the pipe with a view to repairing it, was immediately killed. Deaths equally sudden occur from time to time in large gas-works. One man died recently in Edinburgh when engaged in emptying a purifier.

Then we must remember that 3 per cent. or under, indicates the degree of impregnation at the eleventh hour, after the 33 cubic feet of gas had expended itself in the apartment. It is probable, however, that sufficient injury to produce death had been caused some time before this, when the degree of impregnation was considerably less. This fact has a most important bearing upon questions of public health, and on all questions affecting healthy respiration, especially in cities. How many of us live daily in an atmosphere tainted with an incipient escape of gas, the source of which is often beyond our ken or control! Sometimes it reaches us by permeation from the mains through the earth, and thence through cellars or sewers. A case of this nature was reported in the *Lancet* for 25th October 1873. Recently, in Dundee, a similar occurrence took place, and a whole family had to pay the penalty of death in consequence. Still more recently, a lady died from gas-poisoning in a convent at Bristol, the source of escape being a gas-stove, which was used instead of a fireplace. In Edinburgh several fatal cases have occurred since the death of my patient, and a great many have been partially poisoned since then, the patients having been rendered insensible, but treated in time. One of these was attended by Dr Sidey, another by Professor Maclagan and Dr Affleck, and others were treated in the Infirmary.

Dr Mathews informs me that he was recently called to a house in Edinburgh, where an aged couple had been exposed for some time to an escape of gas. The man was found dead in bed; the woman lay beside him convulsed and unconscious; her hands, feet, and face cold and livid; her breathing imperceptible, and her mouth laden with froth. By prompt and skilful treatment, she was partially restored, but died at the end of a month.[1]

For an account of the Dundee cases, I am indebted to the kindness of Drs Maclagan and Pirie of that city. Time will not allow me to enter fully on the details; but the leading particulars are of great importance, and these I will relate nearly as they were reported in the *Advertiser* of the day.

"Samuel Boase, foundry labourer, his wife, and two children, were found dead in their own house, Louden's Alley, Hawkhill, Dundee. . . . . . All the members of the family were found in bed, apparently asleep. A moment's examination, however, revealed the appalling fact that all were dead, and had manifestly been so for many hours. . . . . . The position of the dead was well calculated to arouse the most harrowing feelings. The husband was lying in the front part of the bed. His wife was next him, and at the back the youngest child—Mary Ann, about two years of age—lay. The features of all three were placid and sleep-like. At the mother's mouth there was a considerable quantity of bloody froth, and the pillow immediately under the husband's head was wet, as if caused by some fluid which had been emitted from his mouth. At the foot of the bed, and lying across it, was the little transverse, and descending colons, were arranged in the usual manner, the latter passing down as far as the left lumbar region. Here the intestine turned to the right, across the abdominal cavity, so as to gain the right lumbar region, where it lay immediately beneath the cæcum, to which it was attached by several adhesions. It then descended into the pelvis, crossing in its course the common and external iliac arteries of the right side, to become continuous with the rectum, which extended along the front of the sacrum and terminated at the anus in the usual manner. The peritoneum investing the ascending, transverse, and descending colons, was arranged in the usual manner, whilst the second or lower transverse flexure was provided with a well-developed meso-colon attached to the posterior abdominal wall, and of such extent as to admit of great freedom of movement of that portion of the gut within the abdominal cavity. There was thus an additional transverse meso-colon situated *below* the attachment of the mesentery, in a manner similar to that in which the usual meso-colon is placed *above* that fold, and between these two duplicatures of the serous membrane were situated the coils of the small intestine. The other portions of the alimentary canal, with the associated glands, were normal. The arteries supplying them were also distributed in the usual manner, the inferior transverse colon, along with the rectum, being supplied by the inferior mesenteric artery. This transposition of the rectum to the right side would not appear to be very uncommon, as I have observed two cases of this kind in the anatomical rooms of the University during the past session. Ellis[1] also refers to three cases which came under his observation.

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[1] Dr Heron Watson, after the reading of this paper, said that he was much interested in the subject, from the fact that, about three weeks ago, his coachman, and his wife and family, were nearly poisoned by an escape of gas into a drain, and from it into the house, which was supposed to be quite protected by traps. It was remarkable, from the distance the gas came along the drain, for the opening was in Queensferry Street, where a pipe had been injured in some drainage works, and his coachman's house was behind Charlotte Square. The family had to sleep for some days with all the windows open to avoid suffocation.

Passing now to the examination of the urinary organs, the right kidney as well as its duct were entirely absent, nor was there any trace of the latter at the normal point of entrance into the bladder, the vesical mucous membrane being uniformly smooth and presenting no indication of any perforation. The left kidney, which was not larger than usual, was circular in form and lobulated on the surface. It was situated close to the brim of the pelvis, in front of the common and external iliac arteries of that side, with which it was in contact. Its duct, which was enlarged at the hilus, so as at first sight to resemble a cyst, gradually narrowed, but continued to be of greater calibre than usual throughout its course, except at the point of entrance into the bladder, where it assumed the normal size. The latter viscus, when injected with water, rose above the brim of the pelvis, and was forced to the right by reason of the unusual position of the left kidney. The left renal artery came off from the point of bifurcation of the aorta. It passed obliquely downward and outward, resting on the front of the left common iliac artery, and entered the upper extremity of the kidney, having previously divided into two branches. The prostate gland and testicles were normal. Unfortunately, by reason of age, had been for many years in Dundee. He is represented to have been a steady workman, and the frugality of the wife is spoken of in very high terms."

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[1] Demonstrations of Anatomy.

The *Times* of 26th September contains the account of an inquest held on the body of a boy who died from gas-poisoning in one of our large English schools. By the kindness of the head master, I am enabled to give a circumstantial account of the case. He writes thus:— . . . "The boy was just approaching his fourteenth birthday. He was shown to his bedroom by the matron at 9 P.M., and was told by her how to turn off the gas. I myself, at 10 P.M., visited the boy, found the gas safely turned out, no sound of an escape, not the slightest scent, and I had a candle in my hand, and took particular notice of the state of the room. The boy was asleep, and had probably been in bed three-quarters of an hour.

"When the housemaid called him next morning, at 20 minutes to 8 A.M., she found the gas jet turned on to the full, the gas hissing loudly as it escaped, and the room full of gas. Our medical officer was sent for immediately, but pronounced that the boy had been dead some hours. He arrived before 8 A.M., as he lives on the college grounds.

"The room contains rather more than 700 cubic feet of air, has one window and one door, and is only occasionally used as a guest-chamber for boys. The gas-bracket, a single arm standing out from the wall, six feet from the floor, with a common fish-tail burner. The boy was found lying on his left side, apparently as he had fallen asleep, after (as it is conjectured) he had turned on the gas by mistake in the night.—I am, etc."

The published reports of the Registrar-General do not furnish details as to the number of deaths directly due to the inhalation of coal-gas; but many of those placed in the returns under the heading of accident or negligence arise from this cause. It is thus extremely difficult to arrive at correct statistics. Dr Stark—to whose courtesy I am much indebted—informs me, that when the barometer is low, these accidents are more frequent than at other times; and that, in such a condition of the atmosphere, gas makes its escape more freely through vulcanized indiarubber tubes, or through any portion of the supply-pipe which may be defective.

Our researches into the literature of the subject are disappointing; for although many cases occur in this country, the records of these are few and meagre. This defect is supplied from the other side of the Channel by Monsieur Tourdes, in a monograph[1] so complete and exhaustive as to warrant and reward a careful study. For my acquaintance with this memoir I am indebted to Professor Mac-

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[1] Relation Médicale des Asphyxies Occasionnées à Strasbourg par le Gaz de l'éclairage, par G. Tourdes, Professeur de Médecine Légale à la Faculté de Strasbourg.

Although much indebted to Monsieur Tourdes, we also owe much to the intelligent liberality of the Government under which he acted, and at whose sole expense the elaborate series of investigations were undertaken and accomplished.

Here the question naturally arises—How were they treated? And this question is very fully answered in the record of the case, which we shall give, as nearly as possible, in the narrator's own words:—

Beringer, of good constitution and robust health, went to sleep on 31st December, after having supped as usual, and without feeling the slightest sickness. We found him on the 2d of January lying upon the floor near the door. There was no evidence of his having been sensible for forty hours. Some traces of concussion about the head and on the body led one to suppose that he had fallen several times, and had struggled in his fall. The intellectual faculties had evidently been involved early, and the pain of breathing in the first moments had been insignificant, since no attempt at escape had been made at a time when such an attempt might have succeeded.

The face is pale, the skin of icy coldness, the pulse imperceptible, the breathing feeble and irregular, the consciousness completely lost.

The jaws were firmly closed, the one against the other; deglutition was impossible.

Such was the condition at the moment when treatment was commenced.

The body was placed in warm linen, and the surface was rubbed incessantly and energetically for two consecutive hours. Towards two o'clock in the afternoon, the pulse reappeared, frequent, but feeble; heat commenced to re-establish itself; the face became coloured. Twenty leeches were applied to the temples.

At 3 o'clock, the face was red, animated; the rest of the body pale; heat re-established; the breathing free enough, but quick, and interrupted by profound inspirations and sighs. There was no cough. The pulse was small, and beating 120 times per minute. The pupils were contracted, and the conjunctivæ slightly injected; all the members were in a state of resolution, as if paralyzed. The patient had not once moved. A single time he had vomited. The stools and urine escaped involuntarily. The intellectual faculties remained a blank. Deglutition becoming possible, we administered an infusion of mint with some drops of ether. A bloodletting of 1 litre was practised while the leeches were still holding. The blood, of a dark-red colour, dribbled at first, but at length jetted freely. During the bleeding a slight amelioration took place. The breathing appeared easier, the patient made a movement with the head, and executed a profound inspiration, which he followed by a noisy expiration. This slight amendment did not last long. Soon the breathing became embarrassed; mucous râles were heard. The pulse again became small and irregular. At 7 o'clock in the evening, the death agony commenced. It lasted long; from hour to hour the breathing became more difficult.

At 5 A.M., the patient expired without having exhibited any convulsive movements. He pronounced two words with a loud

it, and sent her husband to inquire if it was sufficient to indicate danger. He went out, but soon returned, having forgotten to make the necessary inquiries.

In the evening, all the family were reunited around her and had supper. One of the sons feeling himself ill, she rose out of bed for some minutes, and then lay down again. Remembers that towards nine o'clock evening, her husband, sons, and little girl were in bed, and the servant in her room. After that, it appeared to her that she fell asleep, and from that moment lost all consciousness. When pressed with questions, she replied only that a sensation as of a painful dream remained to her. She is absolutely ignorant of what passed between the evening of 31st December and the time of her restoration to consciousness on the 2d of January—in all, forty hours.

She does not know how the little girl, who was put to sleep in her cradle, found herself in her bed, or how the others had got tossed about, struggled, and expired, and how she herself reached the door of the kitchen. It is evident, however, that she had fallen heavily on the floor, and it is probable that she experienced convulsive movements. Yet the shock of these concussions did not rouse her to consciousness. But when the room was broken into, she heard the first words that were pronounced, and recognised one of the doctors who came to her help. It is strange that consciousness, which had been suspended so long with all these things to rouse it, should have returned in a moment when the room was forced open. It is also curious that the woman was longest exposed and least hurt. This was probably due to the system gradually accommodating itself to the changed conditions, or to some idiosyncrasy of constitution by which she was rendered less susceptible than the rest.

The five dead bodies were examined, and exhibited the following *post-mortem* appearances :—

Brain and its membranes congested, chiefly the vessels of the pia mater, which were gorged with blood. Surface of brain and cerebellum present intense redness. The venous system of the spinal canal similarly congested. In three cases, the congestion was carried to the point of causing a considerable shedding of blood between the dura mater and the bony canal. The spinal marrow was normal.

Air-passages.—Strongly injected from base of tongue and velum palati to the last bronchial ramifications. They were filled with a whitish foam, with sanguineous streaks, viscous in quality, and closely studded with minute bullæ.

This condition was almost entirely absent in the father, who had survived nineteen hours and been bled several times.

The pulmonary parenchyma in the five subjects presented a lesion quite characteristic, it being intensely red throughout, which redness you would not have anticipated, judging from the grayish-red appearance of the surface.

Heart.—The blood contained a considerable number of clots, distributed in the cavities of the heart and larger vessels, and more especially in the right auricles.

Liver.—The liver was found with blood of a well-marked reddish tint. That of the father alone (who had been bled) was pale and of grayish-yellow.

The bladder in the four first subjects was filled with an enormous quantity of limpid urine.

The intestinal canal presented nothing remarkable.

After comparing the above conditions with those observed previously by Devergie and Olivier in cases where death resulted under similar circumstances, M. Tourdes considers the following to be the peculiar *post-mortem* characteristics which we may expect to meet with in cases of asphyxia by coal-gas:—

1st, Coagulation of the blood; 2d, Its deepened tinge; 3d, Extreme brilliancy of coloration of pulmonary tissue; 4th, The abundance and nature of the froth in the air-passages; 5th, Intensity of cerebral congestion; 6th, Engorgement of vertebral nervous system, and extravasation of coagulated blood in spinal column; 7th, Vivacity of injection of the mucous surfaces at base of tongue; 8th, Occasional rose-coloured patches on thighs.

The morbid phenomena accompanying the action of gas are thus classified in the order they occur:—1st, Insidious invasion—premonitory symptoms of variable duration; 2d, Headache and vertigo; 3d, Nausea and vomiting; 4th, Affection of intellectual faculties, involving absolute loss of consciousness; 5th, General debility, prostration of strength, partial paralysis, covulsions; 6th, Phenomena of asphyxia appearing slowly, but complete and predominant during last moments of life.

The chemical experiments made by M. Tourdes on the gas of Strasbourg, prepared by the process of M. Sellegnes, and resulting in a simultaneous decomposition of water and shale (schisteuse) oil, have given him the following results:—

Hydrogen, . .	31·	Azote (Nitrogen), .	14·
Proto-carbonate of H.,	22·5	Bicarb. of H. and volat. oils,	6·
Oxide of carbon, .	21·9	Carbonic acid, . .	4·6

Traces of alumin. and ox. of iron and silica, earthy matter, water, coal, bituminous oil, gas, and vapours.

The proportions of these elements, though not always the same, ought not to vary much, because such variations would soon influence illuminating power.[1]

2d, It owes its peculiar odour to the pyrogenic carburets of H. which it contains. This odour, so easy to recognise, is a precious guarantee for the public security. M. Tourdes is assured by experiment, that a mixture of gas with air, in the proportion of 1 part in 150, gives it very characteristically; and it is quite sensible in a 400th, 500th, up to 700th parts; that in 1000th, one still perceives a doubtful sensation, but there was no odour.

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[1] It is notorious, however, that the gas of the present day is systematically diluted with common air, so that we do not consume the article we purchase. This should be made the subject of analysis, and the vendors of it punished as are the vendors of any other adulterated article.

One might believe, at first sight, that the explosibility of the gas would be a sufficient safeguard against asphyxia, but it has been proved by the examination of the place at the time of the unfortunate event at Strasbourg, that a stove had been a long time the seat of active combustion, and that a candle had burned to its end in an atmosphere capable of producing death without causing an explosion. Otherwise, as the result of some experiments made by M. Devergie, and repeated by M. Tourdes, it is proved that illuminating gas does not deteriorate or explode until it is sufficiently abundant to constitute an eleventh part of the air in which is placed a body in a state of combustion.

Not content with results thus obtained, M. Tourdes has wished to confirm them further by experiments made upon living animals. These have been made upon dogs, rabbits, and pigeons. After having tried on these animals the effects produced by the action of air unrenewed, he exposed them in sufficient number to the action of gas mixed with air in varying proportions from 1-4th to 1-75th, and arrived at the following results:—

When pure, it kills immediately.

Forming 1-8th of the atmosphere, it kills a rabbit in five minutes, and a dog in twelve minutes.

Forming 1-15th, a mixture not explosive, it causes death of rabbits in nine, twelve, or fourteen minutes; and of pigeons in five minutes.

Forming 1-30th, its action is very evident, its effects declaring themselves in from four to nine minutes; but it takes a much longer time to kill.

Forming 1-50th, acts with considerable force.

Forming 1-75th, one still observed some slight accidents with rabbits, but the effect was insufficient to cause death, and on prolonging the experiment, one only observed the effects of unrenewed air.

Pigeons have been still more sensitive to the influence of gas; at 1-8th they have felt it with considerable intensity. At 1-130th they have manifested slight evidences of it.

After numerous experiments with the constituents of gas—namely, bicarbonated hydrogen, proto-carbonated hydrogen, hydrogen, carbonic acid, volatile oils, and oxide of carbon—he has proved that the first had a very slight action compared with that of illuminating gas; and that, contrary to the generally received opinion, the volatile oils held in suspension only play a very secondary part in its action, and that the carbonic oxide is the only true deleterious principle.

This may be true as far as regards its asphyxiating properties, but its anæsthetic qualities are doubtless due to its volatile constituents. And practically the latter is the more dangerous quality, because it produces the sleep and insensibility which renders the asphyxia tolerable; and while our greatest safeguard consists in the strong disagreeble smell of the gas, our greatest danger consists in its property of producing speedy anæsthesia. We have indicated that the Edinburgh patient bore a strong resemblance to one under the influence of chloroform, and there is good evidence to show that he had lain thus for many hours; for before being many minutes exposed to the action of the gas, the victim becomes so completely insensible, that neither strong smells nor loud noises, nor the agencies which would otherwise be productive of severe pain, can arouse him. This insensibility occurs before he loses the power of motion, so that he may go moping about his chamber, fall, cut, and bruise himself without being roused to consciousness. Sir James Simpson knew about this anæsthetic property, and he at one time thought of using coal-gas as a substitute for chloroform, but had to abandon it, probably on account of its diffusive force, rendering its action common to patient and operator. If, however, we could separate its pain-destroying from its life-destroying constituents, we might find in the former a valuable and safe substitute for chloroform.

We have endeavoured to prove that in the Edinburgh case the amount of gas in the apartment was only some three per cent., and this caused death. But if capable of destroying life when mixed with air in such small proportion as we have indicated, coal-gas must be very injurious to health when combined with air even in much smaller proportion. Few of us are ever shut up in a room where the smell of gas is unbearable, but many of us are accustomed to tolerate a slight escape; and most of us are, I daresay, able to recall some study or parlour, or office or bedroom, where we often perceive a feeble odour of gas, which may be, and in truth must be, slowly inflicting the gravest injuries on the poor occupant. Who can tell how many of those obscure diseases, accompanied with cerebral symptoms which we cannot account for, may be due to this cause?

If this be true, and if every human dwelling in a large city be supplied with gas, how vigilant ought we to be in guarding every outlet whereby it may reach us, for at any moment we and our household may be exposed to its full danger. It is appalling to think that in almost every room, in every house, in every town and city in the kingdom, there exists an agency of such insidious and malignant potency, and that any night when retiring to rest, an inadvertent turn of a stopcock may open the gates of illness, and hurl a whole household into eternity before morning.

Seeing that these things are so, we would strongly recommend,

1st. That gas should be every night turned off at the meter.

2d. That the pipes and fittings should be examined periodically, and all faults remedied.

3d. That the use of all indiarubber and other flexible tubing, together with its screws and couplings—almost always leaky—should be entirely discontinued.

4th. That on no account should gas be introduced into any sleeping apartment.

5th. That every other apartment where it is used should have an open fireplace, and be well ventilated.

It is not enough to know that for the time being the escape of gas has been cured, for by-and-by it may return; its presence depending much on the state of the atmosphere.

Hence there is often in a room an intermittent smell of gas, perceptible only when the barometer is low, or, in other words, when the pressure of the atmosphere on the gas-holder is so great as to send the fluid through the pipes with perceptibly increased force. Every one must be familiar with these intermitting escapes, and many are deceived by them. For it is a mistake to suppose that cessation of an escape necessarily implies the closure of the aperture of exit.

But we have seen that, despite our utmost care and vigilance inside our houses, we may, like the families in Strasbourg and Charlotte Square, Edinburgh, be poisoned from without. Gas may escape through the main pipes, and permeate its way through the intervening earth into our cellars and houses directly, or first into the sewers, and thence into our dwellings. I am told by men who are constantly engaged in such work, that they never open a sewer without experiencing a strong smell of coal-gas, and that sometimes on introducing a lighted paper, the gas ignites.

The old malleable-iron pipes originally introduced for the underground service are altogether defective, except where exposed to the air.[1] These emit through their whole substance a constant leakage, which finds its way into our sewers and dwellings. The question is therefore one of infinite importance in connexion with the administration of our municipal affairs. They who are responsible for the public health ought to see that all these old and defective pipes are taken up and replaced with new ones made of cast-iron; and where this has already been done, the pipes should be subjected to periodical inspection. Lately, in Edinburgh, a young lady died from the effects of sewer-gas emitted into her room from an opening in the drain-pipe which the plumber had closed, but omitted to solder. To whom was her death due? To the municipality and the plumber. Then the whole supply of gas to a city should be shut off at the works—during the whole of daylight at least. This would withdraw the pressure from within the pipes, and at once lessen by at least one-half the entire leakage into the drains. If our municipal authorities could and would secure this, they would confer an incalculable boon on this and future generations, so far as regards improvement of health; and if, in addition, they would insist on the whole supply being turned off late every night, they would be the means of saving many lives. None of the cases narrated would have been fatal, had this precaution been used. Of course the street-lamps and all out-door lights might be supplied from a separate system of pipes, and also shut off during the day.

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[1] Gas Magazine, 1874.

But I feel that I am indulging in a vain hope. There are too many vested interests opposed to its realization. All we can do at present, therefore, is to endeavour, by careful supervision and watchfulness, to shut out all chances of exposure to this insidious poison, and to wait for further aid from science. Let us hope that Chemistry, from her hidden treasures, may soon unfold to us the cheering beams of a better light by which coal-gas will be at once and for ever superseded. This she certainly shall do in time; may it be in our time. May we soon see these fitful flickering flames extinguished for ever, together with their hideous paraphernalia of tubes and tanks, and battered sheds, and blackened chimneys, which deface the outlines of every city, and fill with a pestilential breath their otherwise salubrious neighbourhood. Until this time comes, the record will remain unfinished which tells of many poor mortals innocently killed by the inhalation of coal-gas.

ARTICLE V.—*Case of Cystic Tumour attached to Kidney simulating Ovarian Disease; Extirpation of Kidney; Recovery.* By A. CAMPBELL, M.B., L.R.C.S.E., Surgeon to the Dundee Royal Infirmary.

MRS S., aged 49, widow, millworker, was admitted to the Dundee Royal Infirmary on 5th November 1873, when the following record of her case was made:—Patient has had five children, the last thirteen years ago, and two miscarriages, one after the second and the other after the fourth child. Up to the beginning of present illness she enjoyed good health. About eighteen months ago, she noticed for the first time a swelling in the left iliac fossa, which has gradually increased in size in an upward and inward direction, and within the last two months has made very rapid progress.

She looks tolerably healthy, but rather languid, and feels unable for any but very slight exertion. Pulse 78, rather feeble; temp. 98·5°; tongue moist and clean; appetite fair; bowels habitually constipated. A tumour, freely movable in all directions, is found occupying the left iliac, part of the hypogastric, and part of the right iliac regions. Its size seems to be rather larger than a man's head, or about 7 inches in the long and 6 in the short diameter. Three separate fluctuating points, each about the size of a small orange, and all communicating with one another, are found on its anterior aspect. Slight pain is caused by moving the tumour. On digital examination per vaginam, the uterus is found to have an abnormally high situation, but nothing else remarkable is found. No dulness on percussion of lungs; respiratory murmur natural; heart normal; urine contains no albumen, and is otherwise healthy. She has lost flesh since disease began, but especially within the last three months. After consulting with my colleagues, Drs Nimmo, Greig, and Miller, ovariotomy was determined on.

Operation.—On 2d Dec. the rectum was emptied by an enema of tepid water, a purgative having been given on the previous day. At 2 P.M. the patient was put under the influence of sulphuric ether. The bladder was then emptied, and the operation proceeded with in the following way:—An incision about five inches in length, from an inch below the umbilicus downwards, was made in the middle line. The skin, fascia, and muscles were rapidly divided, and the peritoneum having been displayed, was divided on a director. The cyst was now reached, and the edges of the wound were held so as to prevent the escape of the contents into the abdomen after puncturing. The cyst had a multilocular appearance and was of a whitish colour. About three-fourths of it was covered by peritoneum. A large ovariotomy trocar, with several feet of indiarubber tubing attached, was plunged into the cyst, but, though firm pressure was applied, and kept up steadily for a minute or two, no fluid escaped. On withdrawing the trocar it was found that the cyst contents were of the consistence of porridge. In these circumstances, the cyst was laid open and its contents cleared out, which amounted to about 2½ pints. The cyst was now dragged forward, but was found to be firmly fixed and attached posteriorly. A minute examination of the interior of the abdomen showed, to our great surprise, that both ovaries were in their natural situation, and of normal size. A little further examination served to show that the tumour, which was the cause of the operation, was a large cyst attached to, or rather thoroughly incorporated with, the lower end of the left kidney. As matters stood, it was at once determined to remove both kidney and cyst. A portion of intestine and omentum, which were very firmly adherent to the posterior part of the tumour, were carefully separated by the fingers; the left ureter and the renal vessels were tied with a strong hempen thread, and the kidney along with the tumour removed. There was considerable oozing, but little free bleeding, from the bed of the tumour. Four omental vessels were seized and tied with Lister's carbolized catgut ligatures, and the interior of the abdomen was carefully cleaned with sponges previously soaked in an aqueous solution of carbolic acid, and latterly in warm water. Deep sutures of silk thread, and superficial of horse-hair, were alternately used, for closing the wound, which was covered with a pad of antiseptic gauze and lint. The patient was then removed to bed, and two hours afterwards a half-grain morphia suppository was administered.

The tumour was found to be caused by cystic degeneration of the lower fourth of the kidney, of which the other parts had the appearance of health.

6 P.M.—Very feeble. Complains of cold, though extremities feel quite warm. Pulse 100; temp. 98·4°.

9.30 P.M.—Urine drawn off by catheter. Has retched a little. Has had a little iced brandy-and-water.

℞ Pulveris opii gr. i. every four hours.

3d Dec.—Morning—Pulse 132; temp. 100·6°. To have enemata of beef-tea and egg-flip; milk, beef-tea, and iced brandy by mouth if possible.

Evening.—Pulse 138; temp. 101·8°. Catheter used twice to-day.

4th Dec.—Morning—Pulse 132; temp. 100·6°; tongue moist, coated in centre with a slight brown fur. Bowels moved freely three times last night. She micturates freely. Abdominal pain is troublesome at times. Continue opium.

Evening.—Pulse 144; temp. 101·4°. Bowels have moved once during the day. She has passed urine several times. Examination of urine—pale amber; acid; 1020; no sediment; a trace of albumen.

5th Dec.—Morning—Pulse 120; temp. 100·7°. Taken food fairly. Feels better.

Evening.—Pulse 126; temp. 100·8°. Complains of abdominal pain especially after swallowing anything. The wound seems to be healing. To-day, for the first time, she has slight abdominal distension.

6th Dec.—Pulse 114; temp. 100·3°. Slept fairly. Bowels moved last night.

7th Dec.—Pulse 108; temp. 100·6°. Passed a quiet night. Has still a little pain in left lumbar region. Bowels moved. Takes food well. Enemata discontinued. To have opium every six hours.

8th Dec.—Pulse 114; temp. 100·4°. Did not sleep much, on account of pretty severe pain in back. To have opium every four hours.

9th Dec.—Pulse 120; temp. 101°. Slept very well last night. Pain in centre of abdomen not much abated, but lumbar pain has almost disappeared. Passed 34 ounces of urine in last twenty-four hours. Sutures removed. Wound healed superficially, except for half an inch at lower end. No pus seen.

10th Dec.—Pulse 120; temp. 101·7°. Slept well. Bowels regular. Abdominal pain slightly increased. Urine—pale amber; acid; 1015; trace of albumen; no sediment.

11th Dec.—Pulse 120; temp. 101·7°. Complains much of abdominal pain. Bowels rather constipated. To have a teaspoonful of castor-oil.

12th Dec.—Pulse 108; temp. 100·6°. Slept very well. Feels much better. Bowels moved after oil. Continues to take food well—viz., fish, chicken, beef-tea, and milk.

13th Dec.—Pulse 108; temp. 101·2°. Slept well. Pain abated. On removing dressings, about two drachms of pus were seen on surface of wound.

14th Dec.—Pulse 108; temp. 101·4°. Slept well. To have two ounces of sherry daily. 33 ounces of urine in last twenty-four hours.

15th Dec.—Pulse 126; temp. 102·2°. Slept well. Two drachms of pus on dressings.

℞ Tinct. aconiti ♏xxiv.; Aquæ ℥iij.

Sig.—Teaspoonful every hour.

Increase sherry to four ounces daily.

16th Dec.—Pulse 96; temp. 97·6°. Perspiring freely. No rigors since operation. Stop aconite.

17th Dec., 10 A.M.—Pulse 108; temp. 98·6°. Complains of a very disagreeable pain in rectum, with an almost constant desire to defecate. To have a quarter of grain of morphia in suppository.

7 P.M.—Pulse 120; temp. 102·8°. Resume aconite.

18th Dec.—Pulse 102; temp. 98°. Slept well till 3 A.M., when she began to retch. Pain in rectum continues. To have a tablespoonful of castor-oil by enema, and a half-grain morphia suppository in evening. Stop opium, aconite, and wine. To have a teaspoonful of brandy frequently. Edges of wound gaping slightly in its whole length, and about half an ounce of pus has been discharged from it daily since the 16th. It is being dressed with strips of adhesive plaster and water-dressing.

19th Dec.—Pulse 108; temp. 98·5°. Has vomited bile frequently during the night. Bowels have moved freely several times. To have a pint of champagne daily.

20th Dec.—Pulse 120; temp. 98·7°. Slept for seven hours last night. Vomiting and pain in rectum have ceased. Feels and looks much better.

21st *Dec.*—Pulse 114. Forty ounces of urine in last twenty-four hours. Pale amber; neutral; 1016; no sediment; no albumen.

28th Dec.—Has taken food tolerably well since last note. Much emaciated.

4th January 1874.—Daily quantity of urine, about forty ounces. From two to three drachms of pus are being discharged daily from wound, which seems united deeply, but is still open superficially.

18th January.—Takes milk and beef-tea, but very little solid food and stimulants. Tenesmus again troubles her occasionally. Has been able to sit up in bed for a short time on each of the last four days.

2d February.—Has been out of bed for a few hours daily during the last week, and has been free from tenesmus for nearly a fortnight.

9th February.—Wound healed except about half an inch superficially. Takes food much better.

24th February.—Health improving. Takes food with a greater relish than at any time since the operation. Wound quite healed.

24th March.—Patient continues to improve. She can walk along the ward without support. Still very pale and thin. Takes food well. Sleeps well. Urine contains no albumen. Removed to-day to Convalescent House, nearly one mile distant.

9th April.—She is now making rapid progress towards complete recovery, is walking about freely, and intended returning home in a few days; but we, knowing that she must return to very reduced circumstances, have prevailed on her to stay for some time longer.

My thanks are due to my friend, Dr Sinclair, medical superintendent, for the unwearied attention he bestowed on this case.

Remarks.—Before surgeons had the benefit of the admirable work "Chirurgie der Nierè," by Simon, of Heidelberg, and the publication of his successful case, extirpation of the kidney was not looked upon as a justifiable operation. So far as I can learn, no successful case has hitherto been recorded in this country. The one now under consideration is not only interesting as a case of recovery after removal of the kidney, but as showing how impossible it is to arrive at anything like an accurate diagnosis in some rare cases of abdominal tumours. We have in the diagnosis no evidence whatever that might lead us to suspect tumour connected with the kidney; but every symptom in the history and examination pointing directly to ovarian disease. The patient (who, I am convinced, gives a correct history) states positively that the tumour first appeared in the left groin, and continued to extend upwards and inwards. No portion of intestine could be detected in front of it, and there was no evidence or history of nephritic colic, albuminuria, or other change in the quantity or state of the urine. The tumour was so incorporated with the cortical substance of the kidney that either the kidney and tumour had to be removed or both left. Another interesting point is the fact that the secretion of urine was so little affected by the operation. Plenty of clear urine was excreted from the first, and there were no uræmic symptoms.

ARTICLE VI.—*Royal Edinburgh Asylum Papers. On Two Cases of Infantile Paralysis, followed by Epilepsy and Insanity.* By JAMES MACLAREN, L.R.C.S.E., Assistant-Physician.

(*Read before a Quarterly Meeting of the Medico-Psychological Association, held at Glasgow on 23d May* 1874.)

To illustrate the few remarks I wish to make, I will shortly describe two cases which have recently come under my notice.

1. A. M., æt. 31, at present and for the last four years a patient in the Royal Edinburgh Asylum, was the second son in a family of five, two of whom died in infancy of brain disease—one at eight years, of chronic hydrocephalus, and the other when a few months old, "in a fit." A. M. was (according to his mother's account) a bright intelligent child, and suffered from no particular ailment. He walked and talked unusually soon, and was altogether very

brisk and sharp. In his fourth year, the following happened:—His mother, on speaking to him one day, found that he could not answer. He was not unconscious, and appeared to notice what was done or said near him, but was unable to articulate. His eyelids and lips were in a state of constant tremor. This condition lasted about two hours, when he suddenly commenced to speak, and seemed quite well. Next day, while in a warm bath, he became quite insensible, and remained so for some hours. His mother's recollection of these two attacks is somewhat impaired, and she can give very few reliable particulars regarding them. Almost all she remembers of the second seizure is, that while he was unconscious, his limbs were relaxed and quite flaccid, and that one doctor who was called in, ordered leeches to his head, and a blister to the back of his neck; and another who followed him, suggested cold to the head, and mustard to the feet. Neither treatment was adopted, and the little patient recovered consciousness after the lapse of a few hours, and it was then noticed that his left arm and leg were powerless. He was very weak for some time, and lay in bed; but about six months after the seizure, he was able to run about. He now began to take epileptic fits, which he has suffered from at longer or shorter intervals ever since. Sometimes he would have a remission from them for six or seven weeks; at other times they came on severely, and at short intervals. No accurate account, however, was kept of their occurrence. As he grew up, his intellect was found to be enfeebled; he was unable to learn anything at school, or to give his attention to any useful occupation. Bodily, he was stunted in growth, and the left arm and leg remained smaller in size than those of the other side. Mentally, he displayed two interesting characteristics of the epileptic, exalted religious enthusiasm, combined with great irritability. After the occurrence of a fit, and more especially if he had several in succession, he used to get much excited, and declare that he saw God, and heard a voice from heaven telling him to go forth and preach the word; and then he used to knock his mother on the head, and thrash her to the best of his ability.

When about twenty years old, he got married to a girl of his own age, who was paralyzed in the lower limbs. Three children were born of this remarkable union, all of whom died shortly after they came into the world. There is no proof or evidence of syphilis having existed in his family. After his marriage, the epileptic fits became more regular and frequent, and his insanity developed rapidly. He was sent to the Royal Edinburgh Asylum in December 1869, the medical certificate stating that he was violent and dangerous to those about him. Since his admission to the Asylum, he is noted in the various entries in the case-book as being generally quiet, cheerful, but silly and enfeebled in mind, except occasionally, when he displays the characteristics mentioned above, only that he substitutes the other patients for his mother when he develops his pugnacious tendencies. He has taken an epileptic fit pretty regularly once in the twenty-four hours, sometimes at night, and sometimes during the day, but at no very regular hour. He occasionally is a few days free from them, and then has several in succession, and more severe than usual.

Present State.—He is a stunted, badly-grown man, with an expression and manner of imbecility. His left arm is shorter and thinner than the right, and he has scarcely any power of voluntary motion in it; owing to the non-development of the muscles, the shoulder droops considerably. The wrist and elbow are constantly flexed, and the fingers in a state of contraction. The left leg is also much thinner than the right, and the heel is drawn up, causing talipes equinus. Temperature is colder in both limbs than in those of opposite side. He walks with difficulty, and with a peculiarly jerking gait, from having to drag the left leg. Tongue when protruded points to the left side. The right pupil is larger than the left. Both are contractile. The sensibility of the arm and leg on the left side are much impaired, and reflex action entirely wanting.

A. M.'s family history, and the progressive degeneration resulting from the existence of nervous disease in it, is interesting. I have traced it to his paternal grandparents. His paternal grandfather was a strong healthy man, following a healthy employment, that of a gamekeeper. He was, however, a confirmed drunkard, and died suddenly of apoplexy. His wife was paraplegic for fourteen years. The offspring of this pair was A. M.'s father, also given to drink, and a paralytic. He married an under-sized woman, evidently of very weak mental power, but otherwise healthy. They had five children, two of whom, as I already mentioned, died in infancy of brain disease; and the two who are at large, and able to earn their own living, are both of them under the average, physically and mentally. A. M.'s marriage produced three children, none of them able to live. It would thus seem that in this third generation the deterioration of the stock has reached to such an extent as to render the procreation of healthy offspring impossible; and so the hereditary disease has worked its own cure, and stamped itself out.

2. P. G., æt. 34, has been in the Asylum for four years. The previous history obtainable regarding her is unsatisfactory, her mother's memory regarding her early life being decidedly defective. The date of her seizure by the paralysis is unknown, but it must have been at a very early period of her life, as her mother cannot remember her ever having the use of the right arm or leg. At two years of age, and without any known cause, she took an epileptic fit, and after this, up till her fourteenth year, she was subject to attacks of *petit mal.* About the latter period, she again became epileptic, and the fits have occurred for some years back with great regularity once in the twenty-four hours. As a child, she was brisk and smart, and learned readily; but as she grew up,

her mind showed signs of enfeeblement, and then, as the fits recurred more regularly, she became noisy, irritable, and sometimes dangerous, and, like A. M., she displayed the curious coincidence of the dangerous violence being accompanied with the most exalted views on religious subjects.

Present State.—She is a tall, fairly well-nourished girl, with the important exception to be mentioned. The right arm is not much larger than that of a child of ten or twelve, the shoulder droops considerably, the wrist and elbow are constantly flexed, and the fingers contracted, and there is complete absence of voluntary motion. The right leg is also smaller than the left, and the heel drawn up, causing, as in A. M.'s case, talipes equinus. Reflex action is almost entirely absent in both arm and leg, and sensation much dulled. During her childhood, to remedy the talipes, tenotomy was performed; but considering that the condition arises from a healthy state of the contracted muscles and paralysis of the opposing one, no good could be expected from such an operation, and in her case none accrued. The left pupil is larger than the right. The tongue, when protruded, points to the right side. She now takes epileptic fits, with great regularity, at least once every day. Her mental state is generally one of enfeeblement, but occasionally she exhibits maniacal symptoms to a very considerable degree, and is noisy and dangerous. The only mental faculty which remains in any way well developed with her, is that of imitation or constructiveness, and she exhibits this by an unusual capacity for drawing. She cannot originate anything in this way, but if a copy is given to her, she can, considering that she works with the left hand, and under considerable disadvantages, and without any education, produce a very fair duplicate.

These two cases present a sequence and relationship which is uncommon, and very few instances of which are noted. Epilepsy or epileptic mania, accompanied or followed by hemiplegia or other form of paralysis, is certainly not a rare thing, but it seems to have been seldom observed in the connexion which these cases exhibit. As the history of the second case is imperfect, it will be well to stick to the other for illustration. This, in many of its symptoms, in the group of muscles it affected, and especially in its results—the wasted and contracted limbs—bears a strong resemblance to a case of the essential paralysis of infants, and I at first looked upon it as such.

Regarding the nature of this disease much difference of opinion exists, and considerable discussion has taken place. About its pathology almost nothing is known. Some maintain that it cannot have a centric origin, and that the irritation causing it must be purely peripheral. If this be so, of course the term cannot be applied to the case I am dealing with. On the other hand, in the limited state of our knowledge of the subject, it seems not an unfair hypothesis to advance that infantile paralysis may only be a form of adult paralysis occurring in an infant. Of course, the state of the brain and spinal cord and the bloodvessels of either in an infant, which would allow of lesions producing these effects, must be very different from what exists in the adult, and the results in after-life also dissimilar; and this alone would justify the use of a distinctive term being applied to the disease when it occurs in childhood. Hitherto, it has mainly been a thing of symptoms, but there seems little doubt that these may be followed by such results as point to centric and permanent organic changes, and a not unlikely effect of these changes might be epilepsy. The opinions of two eminent observers will show the state of the information possessed by leading authorities on the subject. Niemeyer[1] says that the limbs of the same side are never affected in the essential paralysis of infants. Mr W. Adams,[2] in his Jacksonian prize essay, states that frequently the leg and arm of the same side, and more rarely the leg and arm of the opposite side, are affected.

Whatever term may be applied in A. M.'s case to the paralysis which has existed since his fourth year, there seems little difficulty as to the pathology of his disease. The symptoms of the original attack were those of an apoplectic seizure (though such an occurrence at that age is extremely rare), leaving behind it the paralysis I have described. Niemeyer says cerebral hæmorrhages almost always occur from the smaller arteries or capillaries of the brain, and are caused partly by structural disease of the arterial walls, partly by an anomalous condition of the part of the brain surrounding the vessels, and partly by increased pressure of the blood against the walls of the vessels. It is not too much to assume that heredity had assured at least the two first of these causes in A. M.'s case. We have then a hereditary condition which produces a state of matters giving rise to a cerebral hæmorrhage followed by the paralysis. The epilepsy, however, has still to be accounted for, and for the causation of it we must look to the local results of the hæmorrhage. Supposing a clot to have been formed, it seems probable that one of two things has happened to it: either its walls have undergone such changes as to lead to the formation of a cyst which still exists; or it may have shrunk and caused a cicatrix. Either of these would act as a permanent source of irritation, and give rise to the epilepsy, which, reacting on the weakened brain, would produce the insanity and complete the circle.

The prognosis of such a case, with its hereditary history and evidence of a damaged brain, is entirely unfavourable, and little benefit can be expected from treatment. Large doses of the bromide of potassium have been given in both cases, but with no perceptible influence on the epilepsy or the insanity.

As I have said, the history of my second case is not very full, and I have not had such good opportunity of taking note of it, but I trust to have it under observation for some time, and to be able to make some more complete observations on this not uninteresting subject. Both patients belong to that most instructive class, in whom, there being both a bodily and mental defect, the former seems as it were to act as a guide by which we may hope to obtain some knowledge of the state of matters producing the latter, and the study of which offers an almost inexhaustible field for research.

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[1] Text-book of Practical Medicine, vol. ii. page 339

[2] Jacksonian Prize Essay for 1864, second edition, page 82.

ARTICLE VII.—*Note of a Case of Recurrent Peculiar Transverse Presentation, apparently due to Malformation of the Uterus.* By Dr ANGUS MACDONALD, F.R.C.P.E., F.R.S.E.; Lecturer on Midwifery and the Diseases of Women and Children.

(*Read before the Obstetrical Society of Edinburgh, 11th March* 1874.)

MRS MATHIESON, a native of Inverness, aged 33, was married there in the year 1860. Since that date, she has been ten times pregnant, and has now six children alive. While she resided in Inverness, she gave birth to three children: the first a boy, labour natural; the second twin boys, who lived only two days. In this case, the labour was also natural. She next had a miscarriage at about the fourth month.

About ten years ago, Mrs Mathieson came to reside in Edinburgh, where she has continued to live since.

About five months subsequently to her arrival in this city, she gave birth to a healthy boy after an easy labour. In 1866, while standing on the stair leading to her house, she states that she was pushed aside by some men who were leaving a meeting, and falling down three steps, was crushed into a corner of the passage. After getting into her own house she had the feeling that the movements of the child were different from what they were previously to the accident, but nothing specially happened, and she went on to the full time. At the time that this accident occurred, she was about the seventh month of pregnancy. Her labour was long, being of a week's duration, with very trifling pains. It turned out in the end to be a transverse presentation, and had ultimately to be terminated by the late Sir James Y. Simpson, by some form of embryulcia.

Eighteen months after this, she had a girl, which presented by the breech. In December 1869, she was delivered of another female child, which presented transversely.

About a year and a half later, she was delivered of a boy by Dr George Dickson. In this the presentation was a breech.

On the 13th of June 1872, I was summoned by my then pupil, Mr Green, to see her about 2 o'clock A.M. I found her in labour, the os uteri being just fully dilated, and the waters, as far as I recollect, unruptured.

On introducing my hand, however, I found that the child did not lie obliquely across the uterus as is usual in what are called cross births, with the head occupying one iliac fossa, and the breech more or less towards or above the opposite iliac fossa, but discovered that the child was rolled up somewhat like a ball, or, perhaps, more accurately, had its various parts disposed very much as we see a dog roll himself up when he goes to sleep. The whole of the vertebral column of the child was bent forward so as to assume nearly the shape of a semicircle, or, more accurately, of half an ellipse, with a small amount of eccentricity, and the head and neck, with the lower and upper extremities, filled in the other half of the ellipse. The vertex of the child's head lay thus in close relation with the lower end of its sacrum. The back of the child was towards the posterior wall of the uterus. The head, breech, and lower limbs were in contact with the anterior wall. The shoulders of the child were towards the right side of the mother. With very little difficulty I seized the right leg and effected delivery speedily and safely. The child was a female, and did well.

On the 3d of February 1874, my pupil, Mr D. Menzies, sent for me to deliver this woman, whom he had been called in to attend, and had found in labour, with the child presenting transversely. On arriving, I found that the waters had escaped some hours before Mr Menzies had arrived, and that, by the time I saw the patient, they had been at least three hours away. I put the patient under chloroform, and on examining into the state of affairs, I found matters precisely as I had found them in June 1872. With no great difficulty I succeeded in hooking down the right leg, and turned with very little trouble. Indeed, I did not require more than the index and middle finger to be introduced into the uterus. Some time was lost in getting the occiput of the child forwards, as the body of the fœtus was delivered with the abdomen anteriorly. Apparently in consequence of this delay, the child, though born alive, could not be brought to breathe well, and died shortly after birth. The mother made a good recovery.

Examination of the pelvis revealed everything normal, so far as regarded its bony framework. But on carefully examining the uterus on the last occasion, which I am sorry I omitted to do on the previous one, I noticed a very peculiar and extremely well-marked elongation of its transverse axis. After the separation and expulsion of the placenta, the uterus contracted firmly and uniformly; but instead of its shape being that of a ball or an elongated oval, it was flattened anteriorly, shortened longitudinally, and extremely elongated transversely. The uterus indeed assumed, when contracted, the shape of a fan. The transverse axis, so far as I could judge, was elongated 2 or 2½ times the usual proportion, and the organ felt thin antero-posteriorly when seized between the finger and thumb. This peculiar condition I pointed out then and there to Mr Menzies; and meeting, just as I was leaving the house, with my

friend Dr M'Gibbon, I took him back with me, and showed him the peculiar condition of the uterus. He fully confirmed the accuracy of the observation.

I had hoped to have been able to tell the Society whether this peculiar condition of the uterus was persistent in the unimpregnated organ; but on calling yesterday with the view of making the necessary exploration, Mrs Mathieson, with that fine sense of gratitude for relief from serious difficulty, which one occasionally, though I must confess rarely, meets with in these poor people, refused me all facilities to settle this point.

I have recorded this case because I believe this peculiarly great elongation of the transverse diameter of the impregnated uterus, in comparison with the longitudinal and antero-posterior ones of the organ, affords the most rational explanation of this very strange tendency to abnormal presentation.

I am exceedingly sorry that I did not carefully examine the uterus on my first attendance, as I cannot assert positively that such was its condition then. I think, however, that the fact that I found the child's position the same, and its parts disposed in a similar manner in this as on that occasion, affords a strong presumption that the condition then existed.

It seems to me that, ever after the injury received by this woman in the stair, some peculiar change of shape had been impressed upon the organ. At all events, her obstetrical history, after this accident, is very curious indeed. Since then she has had six labours, in which the fœtus presented transversely in four cases, and in the two remaining cases the breech came first. Now I hold that, normally, the fœtus takes the position which gravity gives it, and can do nothing else so long as it is wholly or nearly submerged in the amniotic fluid; the reason being that, if it were kept out of the position which gravity would make it assume, it must be sustained in that position by the action of a constant force, for we know that a solid body floating in a fluid can only rest when the centre of gravity of the solid and the centre of gravity of the fluid displaced by the solid, are in the same perpendicular line. But we have no other constant force acting upon the fœtus. I am therefore obliged to throw overboard alike the exceedingly ingenious theory of Dubois, in reference to small volitions of the fœtus, and the expansion and advance made upon it by Sir James Y. Simpson, who, in the light of a more advanced physiology, ascribed the position of the fœtus in utero to reflex action of the fœtus. I consider that neither of them could maintain the fœtus in any position as against gravity without perpetual action, and this would wear out the nervous and muscular forces of the fœtus. And, again, by the law of parsimony they are excluded, because gravitation gives us a force, which is always present and perfectly able to account for and to maintain the position of the fœtus in utero, and why then assume another?

But, while allowing all this for the normal condition of a healthy pregnancy, we must grant that all children are not born head foremost, and that pathological conditions and various accidents lead to malpresentation. It has been lately observed, chiefly by our German brethren, as a result of frequent examination during the latter weeks of pregnancy, that there is even then a much greater frequency of change of position of the fœtus than we had been wont to believe. It has always been known, that in the earlier six or seven months, the fœtus moves about with great freedom, and in all odd sorts of ways. It was not, however, believed, till within a few years back, that the fœtus retains till the very end of the period of utero-gestation a considerable amount of its old habit of changing its position, and gets ultimately fixed only when the uterine contractions become established. This tendency to change of presentation in the latter months, even although it is so strongly insisted upon by Schultze, Schroeder, and others, may as yet be held as not fully established. It is made out so far, however, as to explain that a great number of irregular presentations are due to the uterus commencing to contract upon a child which is not favourably placed at the moment for assuming the position with the vertex at the internal os.

Thus suppose, at the commencement of labour, the fœtus lies, as it usually does, with its longitudinal axis more or less obliquely to the longitudinal axis of the uterus. If the contractions fail to establish a coincidence between the longitudinal axis of the uterus and of the fœtus, a more or less transverse position is the result, and thus we get one or other of the many forms of cross-birth.

Such contraction, however, fails completely to account for such a disposition of the child's parts, as I found on the two occasions mentioned. In those cases there was no obliquity whatever. The fœtus coiled upon itself was so disposed that its largest diameter was distinctly and absolutely at right angles to the longitudinal axis of the uterus. This could not have been of recent origin. I am therefore driven to the conviction that this peculiar presentation was due to the malformation of the uterus, which did not permit the fœtus to rest or develop, except with its long axis in that of the long—that is, in this case, the transverse—axis of the uterus.

I am glad to be able to quote the great name of Simpson in support of such a view, although I cannot accept his explanation of how such abnormality acts. In his paper upon the Attitude and Position of the Fœtus in Utero, vol. ii. of Sir James Y. Simpson's Obstetrical Works, edited by Priestely and Storrar, Sir James, in referring to malformations of the uterus as a cause of malpresentations, quotes a case which is almost identical with mine, only that it was examined with care before the labour was terminated. It runs as follows:—

"A patient in her first two labours had the arm of the child presenting. In her third labour, the same presentation recurred. On examining the uterus before delivery, Dr Lecluyse found it of an abnormal configuration. It was short and depressed in its vertical direction, but large and expanded towards either side. It was ellipsoid instead of pyramidal in shape, and had thus gained in lateral width what it had lost in perpendicular height. Its long axis was from side to side. . . . . After the uterus was emptied in this case, the organ still presented the same deformity."

A point of this case, well worthy of my calling the attention of the Society to, is, that in the last case the fœtus did not rotate when the breech became engaged in the pelvis, as it usually does. The abdominal aspect of the child continued forwards and to the left throughout, leaving the nucha of the fœtus towards the right and posteriorly, and the chin towards the left and anteriorly, when the head engaged at the brim. The delay and difficulty in getting the occiput forwards under the symphysis at the outlet, as also the fact that the child had been exposed to pressure for several hours before medical aid was secured for the patient, sufficiently explain the death of the child.

As connected with this irregularity, and as bearing upon turning in general, especially in so far as regards the selection of the proper leg, I may draw the attention of the Society to the important observations lately published on this subject by Fritsch, in the Archiv für Gynaekologie, Band iv. S. 483.

The drift of these is, that, provided you turn properly, you need not care whether at the termination of the act the child is situated with its back forwards or backwards. If let alone, the labour will most commonly terminate by the back rotating forwards, during the passage of the body of the child as a result of the natural mechanism in the small pelvis. This, then, according to one author, does away with all those vexatious rules which one sometimes attempts to learn, as regards the seizure of the proper foot in turning. He recommends, very rationally, to seize the nearest foot in all cases, and turn as carefully as possible, leaving all attempts to bring the child's dorsum forwards to the mechanism of delivery. He likewise explains the prevalence of mistaken notions on this subject as the result of obstetricians confounding the position of the fœtus after turning, with its position when the body is being expelled through the small pelvis. Finding the back of the child far most commonly forwards, in the latter they explained a great deal that was the result of the natural mechanism of the presentation to the good effects of the particular limb seized by them in turning according to their rules. Had they taken the trouble to examine accurately, as he did, how the child lay immediately after they turned, they would have been less troublesome as to rules of procedure. To the truth of his opinions, I think most careful obstetricians of experience will subscribe.

ARTICLE VIII.—*Case of Absorption of an Exostosis.* By JOHN CHIENE, M.D., F.R.C.S., F.R.S., etc.

Is an exostosis, after it is broken off by violence, ever absorbed? I cannot find this question discussed in any work on pathological anatomy. The following account of such an occurrence is therefore worthy of record:—

G. B., aged 14, was brought to me, on the 12th of April 1873, by Dr John Brown, in consequence of a hard movable tumour under the muscles of the thigh, above the inner condyle of the right femur.

History.—Twelve months previously, while at play, he fell, two or three of his companions rolling over him; at the same moment he received a blow on the inside of the right knee. Swelling and pain ensued, and for a time he was unable to bend his knee. Under hot fomentations the pain and swelling gradually subsided, and he then felt for the first time a hard lump, as he expresses it, which he could easily move backwards and forwards. Since the subsidence of the acute symptoms, iodine has been painted over the tumour. He cannot say that there has been any change in its size since he first noticed it. He never noticed anything wrong with his leg before the injury.

Present condition.—There is now an irregular osseous mass, the size and shape of a walnut, under the vastus internus, two inches above the condyle. It is freely movable, and when moved it rubs against an osseous surface on the femur. Both surfaces are irregular, and the feeling of crepitus, although perfectly distinct, is somewhat modified, as if the opposing surfaces are covered by fibro-cartilaginous material. He can bend his knee, and only complains that the part becomes sore after violent exercise, and after the tumour is freely manipulated.

Diagnosis.—An exostosis (unnoticed until the injury), broken off from the femur by the blow.

Believing with Billroth, when speaking of operations on exostoses close to joints, that "it is neither advisable nor necessary to undertake such operations unless the impairment of function be so great as to balance an operation dangerous to the joint and to life," and hoping that absorption of the tumour would take place after its principal vascular supply was cut off, I recommended delay before removal of the tumour. A strong elastic knee-cap was ordered, and the patient told to abstain from violent exercise.

15th May (one month after I first saw him).—Tumour apparently smaller. No pain nor uneasiness.

March 1874.—Since last report the patient, a most intelligent boy, says that the tumour gradually decreased in size. He says that on the 1st of October he could still feel a small lump, and on the 15th of October he could feel nothing, and removed the knee-cap;

and since then he has never paid any attention to his leg, and is now quite well.

On 12th March 1874, and again on 12th April (exactly a year after I first saw him), I carefully examined the patient, and with the exception of a slight linear projection, an inch in length, on the osseous ridge, leading up from and about two inches above the internal condyle, I cannot distinguish any difference between the limbs. The movements of the joint are perfect.

There is an obscure feeling, as if there is a bursa over the projection, the muscles moving smoothly over it.

Such a case suggests two interesting questions in the treatment of exostoses near important joints:—

1. Should not an attempt be made in the first place to break off the exostosis without exposing it, by laying hold of it with large forceps, well padded, so as to prevent injury to the skin, in the hope that absorption of the tumour will take place in consequence of its principal blood-supply being cut off?

2. When the surgeon meets with an exostosis which has been broken off by accident, he should wait, and not cut down hastily on the tumour to remove it. In such a case as the one just described, there is always a risk of implicating the knee during the operation. To run such a risk, when we consider how little annoyance the tumour was giving the patient, was, in my opinion, unjustifiable. The result has justified the expectant treatment of the case.

ARTICLE IX.—*On the Non-existence of Pressure on, or Compression of, the Brain.* By NEIL MACLEOD.

LET us for a moment consider what are the normal conditions in the interior of the cranium as regards pressure.

The brain is subjected to pressure between, on the one hand, the force of the blood, on the other, the resistance offered by the rigid bony wall of the cranium—an example of action and reaction. This wall, being rigid, cannot exercise *active* force on the surface of the brain; but force is always called into action in the form of resistance which it offers to increased force from within. If at any time circumstances arise in which this condition of the wall is altered, and *active* force comes into play from without, if this new force is greater than that of the blood—that is, than what is exerted by the bony wall in virtue of reaction—it follows that the blood must retire before the superior force, if the brain substance or contents of the cranium be not compressed in the true sense or the wall of the cavity does not give way. Thus, the brain is not subjected in such a case to *abnormal* pressure of any moment which can exist for any considerable time, because the additional force will expend itself in driving out such contents of the cranium as are capable of being displaced; and when this has happened, the forces have become equal on both sides—a return to the *normal* condition, so far as pressure on the brain is concerned.

There is, however, a slight additional pressure, which is of no great moment, and which we shall notice afterwards.

When a part of the cranial wall is displaced inwards, the intracranial space must be either—(1.) Not lessened in extent; or, (2.) It is.

1st. If the cavity is not lessened in extent, it must be altered in shape, and there is consequently an alteration in the relation of its contents; but with this condition we are not at present concerned.

2d. If the cavity is diminished in extent, this must be accompanied by—(1.) A decrease in the amount of its contents; or, (2.) Compression of these contents—compression in its sense of occupation of less space by the same amount of material.

1st. A decrease of the contents. The only contents which can be decreased are—the cerebro-spinal fluid, the lymph, and the blood.

The cerebro-spinal fluid in the healthy state, it is believed, amounts to from two fluid drachms to two fluid ounces. What proportion of this is cranial has not been estimated, so far as I am aware. If, therefore, the decrease of cavity is small in amount, not exceeding the space occupied by the amount of cerebro-spinal fluid in the cranium, according to some, this fluid may be displaced, passing down into the spinal canal. Let us follow it there.

This canal has contents, and these contents *fill* the space in its interior, leaving no part unoccupied. Can it, therefore, accommodate the new supply of fluid from above, which is said to find its way thither?

In order to do so—(1.) The cavity of the spinal canal must be enlarged; or, (2.) Some of its contents must be displaced; or, (3.) Its contents must be compressed.

1st. The spinal cavity may probably become enlarged to some extent, as its walls are not completely rigid like those of the cranium. The question then arises, Can the cavity be *so* increased as to accommodate the new supply of cerebro-spinal fluid? In cases where that fluid is small in amount, it probably is enlarged sufficiently, but, when it amounts to two fluid ounces, it is *questionable.*

Another consideration suggests itself. If the wall of the canal is capable of resisting a force a little greater than that of the blood, then this resistance being communicated up the canal to the cranium, the cerebro-spinal fluid will not leave the cranial cavity so long as there is there present another fluid to be displaced, whose resistance is less, viz., the blood. If the spinal canal, then, cannot accommodate the new fluid in this way, it will do so by

2d. Displacement of the only displaceable content, the blood—that is to say, leave a less supply of blood for the spinal cord, etc., than ordinary—a condition, the importance of which we shall see in connexion with the brain. If it displaces the blood at all, why not do so in the cranial rather than in the spinal cavity?

3*d*. Compression will be considered in connexion with the same condition in the cranium.

To return to the cranium. If the decrease of cavity is greater in amount than was assumed above, than the space occupied by the cranial cerebro-spinal fluid, what is the result? (We shall always suppose that the cerebro-spinal fluid may be displaced to some extent; indeed, to take the most favourable view of the case, suppose that the *whole* of it may be so got rid of.)

I am not aware that the amount of lymph, or even that of the blood, of the cranial cavity has been estimated. The lymph is small in amount, and therefore we shall regard it as practically of no account. Then, when the decrease of space in the cranial cavity is greater in amount than that occupied by the cerebro-spinal fluid, blood must be displaced, and that in proportion to the excess of lost space over the space occupied by the cerebro-spinal fluid—that is, we have now a condition in which brain, membranes, etc., are supplied by a less amount of blood than in the normal condition—a point whose importance is very great when we consider the nature of the tissue to be nourished.

In many cases of depressed fracture, the intracranial space is still further lessened by the presence of a blood-clot, which has practically the same effect as the depressed bone in lessening the *available* space. The case may be expressed thus:—By how much the cranial cavity is lessened in space, by such an amount of blood as would occupy that space (less that occupied by the cerebro-spinal fluid) is the blood-supply of the brain deficient.

Let us take an example. Let depressed fracture take place, with extravasated clot, decreasing the cranial cavity by a space which would be occupied by two fluid ounces of blood, and let the cerebro-spinal fluid in the cranium in this case be one fluid ounce, then the brain is deprived of one fluid ounce of its normal supply. In many cases a much larger deficiency would be the result.

A question here arises, Are the symptoms of depressed fracture due to this deficiency in the blood-supply to the brain? When the supply becomes less than is sufficient for the brain to carry on its functions, there must be suspension of these—that is, coma, and coma so long as the insufficient supply is kept up. Such a cause appears to me to be quite sufficient of *itself* to cause all the symptoms. Here, of course, I exclude lesions of brain-substance, which produce symptoms of a kind different from those attributed to "pressure" and "compression." "Pressure" and "compression" I shall treat of afterwards, when I shall attempt to prove that they can only exist when all the blood has been expelled from the cranium, or when egress of blood is impossible—that is, in a condition incompatible with life.

The conditions are the same in cases of extravasated clot without depressed fracture. There is lessening of the cranial cavity by the pressure of the clot, quite the same in all respects as in depressed fracture, save that here there is the normal amount of blood present in the cavity, but what is *available* for nutritive purposes is lessened by the amount of clot.

It must be remembered that in these cases there is the normal amount of structure to be nourished; and this I note to compare with another condition in which the brain-substance is diminished.

Again, it is said that the general symptoms of depressed fracture, etc., are those produced by *pressure* or *compression*. Is it so? No doubt, pressure caused the depression of bone; but after the bone was displaced, and the force causing it had ceased to act, so far as pressure is concerned, the wall of the cranial cavity is in the same condition as before the injury. It is still rigid, and, in virtue of its rigidity, capable of *resisting* the expansive force of the blood-flow, which is exactly what the wall did before the injury. It bounds, it is true, less space, but that we have considered.

There is, however, additional blood-pressure now acting, being that caused by the whole blood of the circulation being pent up in fewer vessels, which are therefore put on the stretch, and therefore exert a greater force on the blood; yet this certainly is not sufficient to cause the symptoms in question, as evidenced by the absence of these on emptying a limb of its blood and applying a tourniquet, when the pressure from the same source must be much greater than in the case supposed of a two-ounce clot, or even one of three or four times that amount. In cases of clot without fracture, from whatever cause, there is no such additional pressure, for the fewer vessels are then occupied by a proportionately less amount of blood.

This use of the word "pressure" is a very unhappy one. Any body with a weight on it is under conditions of pressure. Very different is it in depressed fracture and extravasated clot, where, if pressure existed, the blood would continue to be forced out until such proportion of it as could be displaced, or the whole of it, had left the cavity, if, indeed, the force had not been expended before such a result was reached, or until the force had become equal to that of the circulation, when the normal condition is again attained. The common idea appears to be, that "compression," produced by depressed fracture or clot, is a condition in which the brain, etc., is being squeezed between a force supposed to be acting and a something resistant, whose existence has never been questioned, and which no one seems able to indicate—a condition which can have no real existence until all circulation in the cranium has ceased.

If "compression," in its true sense of occupation of less space, does ever take place from a great force acting on the surface of the brain, and not allowing time for the escape of displaceable contents, this compression will relieve itself by reason of elasticity, and the condition, so often referred to, of diminished fluid contents produced; there must be here diminished cavity coincident with compression. A force necessary to cause compression of any moment would be more liable to result in rupture of the cranial wall.

It has been proposed by Professor Ferrier of London, in cases of extravasated clot without depressed fracture, to trepan the skull at *any* point, not necessarily over the clot, and, by relieving pressure, procure relief of symptoms. If the symptoms disappear, would it not be by causing the brain, etc., to bulge out at the opening to an extent necessary to allow the entrance of a sufficient supply of blood? and not by relieving "pressure," which, in all probability, does not exist. It is very questionable whether the amount of bone removed by an ordinary trephine would be of any use when the clot is not small.

Are not the general symptoms of depressed fracture and extravasated clot accounted for by the new condition of the circulation? viz., insufficient blood-supply to the brain.

There are conditions in which the amount of blood circulating in the cranium is much below the ordinary standard, and in which there is present foreign material to a large extent, and therefore virtually producing a decrease of intracranial space, and yet there is total absence of general symptoms. Such a condition may be accounted for in this way:—

Let X equal the normal amount of brain in the cranial cavity, and let it be supplied by blood represented in amount by x. Now, let us suppose disorganization of the brain-substance to have taken place, to the extent, say, represented by Y, by softening and the formation of an abscess.

The supply of blood for Y brain is y the same proportion of Y that x is of X.

The amount of blood left in the cranium after such a change is at least

$$x-y,$$

and the amount of healthy brain texture left is

$$X-Y$$

—that is to say, what brain-texture remains is supplied by its normal amount of blood, hence the absence of general symptoms. There is as much "pressure" present in this case as in the case of the offending blood-clot, but there is less brain-substance to be nourished.

Let Y represent a blood-clot. Here there still remains the original amount X of brain, etc., and that to be nourished by a supply of blood represented in amount by

$$x-Y,$$

not merely

$$x-y,$$

an amount often, in all probability—nay, in cases of large clot, certainly—insufficient for the healthy performance of the functions of the brain.

Note.—Since writing the above, on reconsideration of the passage of the cranial cerebro-spinal fluid into the spinal canal, I think I can adduce reasons to prove, that under none of the conditions above referred to, is that fluid ever displaced in the way supposed; but this conclusion I have arrived at too late for insertion at length in this present article.

Part Second.

REVIEWS.

General Report, No. 4, on Lunatic Asylums, Vaccination, and Dispensaries in the Bengal Presidency for the Year 1871, *with Appendices.* Compiled by Assistant-Surgeon K. M'Leod, A.M., M.D., Secretary to the Inspector-General of Hospitals, Indian Medical Department. Calcutta: 1873.

This blue-book consists of a number of reports bearing on medical subjects from the Bengal Presidency, sent for the information of Government by the Inspector-General of Hospitals, Dr G. Campbell Brown, an officer of great experience and distinguished services in the campaigns in Cabul, the Punjab, and the Indian mutiny. They are compiled, as stated in the title, by Dr K. M'Leod.

The first subject dealt with is the lunatic asylums. Of these institutions there are thirteen—certainly a very small number compared with the great population of the Presidency. Many of them are of new creation. The insane population in twelve of them, whose statistics are given, is 1847, of whom 1422 are males, and 425 females.

From the tables given, it appears "that 45·2 per cent. of admissions is an average rate of recoveries when all the asylums of the Presidency and many years are taken into account. Cases of mere improvement are not reckoned. Different asylums fluctuate between 63·12 (Delhi) and 24·76 (Jubbulpore). The rate of recoveries on admissions in 1871 was 44·2. The ratio on average population is 24·9, and 1871 gives 23·5. The recovery rates of English pauper asylums are—on admissions 35, and on average strength 10. Thurnam, in his work on the Statistics of Insanity, states that, 'as regards the recoveries in asylums which have been established during any considerable period, say 20 years, a proportion of much less than 40 per cent. of the admissions is, under ordinary circumstances, to be regarded as a low proportion, and one much exceeding 45 per cent. as a high proportion.'"

There are great varieties in the death-rate of different asylums. The percentage of death to average strength is 15·6, and 10·7 to the total number treated; in the Lucknow Asylum, the death-rate was as high as 42·9 to the average strength, and 27·5 to the total number treated; while in Patna, the death-rate was as low as 5·6 to the average strength, and 4·2 to the total number treated. One of the most common causes of insanity in India, especially amongst the Hindus, is the use of some of the different forms of *cannabis* or Indian hemp. The Mahomedans are said to prefer the more stupefying effects which follow opium-eating. "Habitual intemperance from opium," Dr Wise, Superintendent of the Dacca Asylum, remarks, "is rarely followed by insanity. The intellect becomes deadened and blunted." Dr Rice says that those who use opium to excess "become quite fatuous." Indian hemp is generally taken in the form of *bhang*, a liquid extract, which is drunk, or *churrus*, which is smoked. Dr Rice remarks that Indian hemp is responsible for 21 out of 54 admissions in his asylum. The following quotation from a Report by Dr Penny, who is in charge of the Asylum at Delhi, is so interesting, that we venture to give it at length:—

"Each and all of these forms of Indian hemp act upon the nervous system, exercising a peculiar influence over the brain and spinal cord, and the nerves connected with them, and also paralyzing the sympathetic nervous system, as shown in the arrest of the secretion of the salivary glands and the liver. Their action is chiefly on the mental faculties; and if long continued they will produce chronic disorder of the mind. Their first effect is that of a stimulant, exalting or exciting the mind; for we find an indescribable sense of happiness, a tendency to laughter, great strength; sometimes the *churrus*-smoker will feel as though he were rising through the air, and descending again, or an irresistible propensity to dance or jump. Both after drinking *bhang* or smoking *churrus* or *ganjah*, there is a burning feeling and dryness of the throat. Sometimes there is oppression of the breathing; catalepsy is said to be an effect. There is no doubt of the appetizing influence all forms of *cannabis* have; and if milk, ghee, and lots of nourishment be taken, much of the injurious action is prevented.

"After the stage of excitement, the mind becomes confused, attention is arrested, the man becomes stupid, and at last complete intoxication ensues—in fact, it is the stage of depression. Old *bhang*-drinkers, *churrus* and *ganjah* smokers, and *majoom*-eaters are, as a rule, emaciated; they lose vital energy, become impotent, forgetful, or are weak-minded and melancholy.

"Others again, especially *churrus*-smokers, are exceedingly irascible, and occasionally violent, abusive, or maniacal.

"Again, *churrus*-smokers are often asthmatic. I can remember several instances. They become so from an emphysematous state of their lungs; are like broken-winded horses; they have ruptured the fine air-cells from long-continued and oft-repeated inspirations and expirations. Hæmoptysis is not uncommon amongst them.

"There is a state of brain produced by over-indulgence in *bhang* or *churrus* which corresponds to delirium tremens; suspension of its use may cause a state of most violent excitement. The patient talks incessantly, pelts others with bricks or stones, bites those about him, tears his clothes, and it will be dangerous to approach him. There is great thirst and craving for food. The skin is hot, but there is no fever. He is decidedly sleepless, for he brawls and shouts all night.

"He may die from exhaustion of the brain or stoppage of the heart's action, from paralysis of the sympathetic; or he may gradually recover.

"*Insanity*, or permanent disorder of the mind, is a result of the evil habit of the over-indulgence in this narcotic, I think; more frequently in those who do not feed liberally.

"On a reference to the annual report of the lunatic asylums in Bengal for 1871, in Dullundah, Dacca, Patna, Cuttack, Moydapore, I find that *cannabis* and spirits constitute 31 per cent. of the whole 78 of the known causes of insanity.

"In previous years the percentage has been even as high as 50 per cent. in some of these asylums.

"In my small lunatic asylum in Delhi, during the past five years, I have had about fifty genuine, well-marked cases of mental disorder from the excessive use of Indian hemp.

"The following table shows the percentages of total treated:—

"In 1867, . . .	11·92 per cent.
„ 1868, . . .	16·61 „
„ 1869, . . .	17·68 „
„ 1870, . . .	20·60 „
„ 1871, . . .	17·14 „

"These figures do not represent the whole of the cases of insanity caused by *cannabis*, because there are so many admissions where the cause is unknown, and history a mere blank; but they show the fact that disorder of the mind often results from this most pernicious habit.

"The common form of insanity from Indian hemp is dementia, with or without melancholia, where the patient is totally indifferent to persons and things, and to what is passing around him. He seems to hold no intercourse with the world; has a stupid stare, is very quiet, sleeps well, and has a voracious appetite. There are three or four of these cases now in the asylum.

"A less frequent form from the incautious use of hemp shows itself in excitement and paroxysms of violence, with intervals of quiet. They talk loudly, are authoritative and commanding, and most irritable. This state will last for a day or two, and the patient become more tractable, but he is never safe.

"Good feeding, great kindness, indulgence of every harmless kind, strict cleanliness, tobacco, and careful watching of all the functions of the body, contribute towards the relief of these most unhappy sufferers."

Paralysis of the insane is noted by Dr Wise as very rare in the Dacca district.

The Report of Vaccination is of great interest. In 1871–72, 1,017,016 persons were successfully vaccinated in the Presidency, and the number is steadily increasing every year. This progress is altogether due to the exertions of the Government, who have had many difficulties to struggle with, owing to the prejudices and inertness of the natives. Though vaccination is believed to have been used in ancient times in India, inoculation is the general preventive now used by the Hindustanis. It is practised by hereditary guilds, sometimes by the Brahmins, and sometimes by the Mali or gardener caste. It has been found very difficult to overcome the opposition of these men. It has been thought best to employ Brahmins as vaccinators, and to seek to convert the hereditary inoculators to the practice of vaccination. The inoculators, however, find their own practice much more profitable; "not only are they employed to inoculate, but they are also employed to cure the disease they have caused. These men are therefore better able to play on the fears and prejudices of the people, and to make larger gains. It is often stated in books of hygiene that inoculation, on the whole, increased the prevalence and mortality of smallpox, as it spreads the disease beyond the inoculated, it being impossible to confine the effects of the disease to the person operated upon. This, however, does not seem to hold good in India. Natural smallpox," we are told, "causes a mortality of from 10 to 50 per cent. among those attacked; inoculated smallpox does not kill, *when all conditions are favourable*, more than 2 per 1000, it is said (though precise information is wanting on this point). The argument in favour of inoculation may therefore be stated thus:—If each member of a population of 1,000,000 is sure to contract smallpox at some period of life, there will be a loss of from 100,000 to 500,000 lives. If, on the other hand, each member of that community is inoculated, the total mortality from smallpox will be 2000. This way of putting the case represents the extreme gain of life from the practice of inoculation." And hence Dr Charles and Dr Wise of Dacca have agreed that inoculation did not cause so much loss of life as was generally supposed, and were not in favour of any compulsory suppression of the operation. Their views have not been adopted by Government; and as at least two out of a thousand of the population die of inoculation, it would appear that the Government is right in persevering, by every prudent means in its power suppressing the one practice, while it does its best to introduce the other.

The Report also contains an interesting account of leper hospitals, of which there appear to be thirteen, many of them maintained by private subscriptions.

There are also reports on the native hospitals and dispensaries, and the medical schools, and some statistics of amputation of the thigh.

Altogether the Report affords very gratifying proof of the good work the medical officers of the Bengal army are doing in the East. We must share the glory of conquering India with the Mongol hordes of Timur Khan and the Patan soldiers of Baber, but to give to that great country the lessons of science and the benefits of medical discovery, is a glory that is all our own. It justifies the blood we have shed, and shows that the lives of our countrymen have not been lost in vain.

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1. *Du Traitement des Rétrécissements de l'Urèthre par la Dilatation Progressive.* Par E. B. CURTIS, Docteur en Médecine. Travail couronné par la Commission du Prix Civiale pour l'Année 1872. Paris: 1873. In 8vo de 112 pages. London: Baillière, Tindall, and Cox.
2. *Diseases of the Urinary Organs, including Stricture of the Urethra, Affections of the Prostate, and Stone in the Bladder.* By JOHN W. S. GOULEY, M.D., Surgeon to Bellevue Hospital, etc. 8vo, pp. 370. With 103 wood engravings. New York: William Wood and Co. 1873.

THE literature of stricture, already extensive, is daily increasing. Books, pamphlets, isolated cases, fill the library shelves, while instruments of various kinds, many of great complexity and wonderful mechanical ingenuity, tax the skill of the surgical instrument maker, adorn his shop window, and swell the surgeon's bills. Notwithstanding all the writing and all the inventions, however, it comes to this, that in at least nine out of ten cases of stricture, the surgeon has to use and the patient has to be cured by the old-fashioned plan of gradual progressive dilatation of the stricture by bougies passed at intervals, and gradually increasing in size. Thus it happens that for a surgeon to be successful in the treatment of stricture, it is still the skill and gentleness of his hand, rather than the length of his purse, that is needed, and to know how to diagnose and treat urinary complications and constitutional peculiarities is a more valuable weapon than any of the instruments for internal urethrotomy or divulsion of strictures.

This is the text and marrow of the first of the books which heads this notice, which is a most careful and systematic account of the methods, advantages, risks, and results of treatment of urethral strictures by dilatation. From its conclusions we extract the following axioms:—

> "1. Temporary dilatation, if applied according to the rules already given, is a good treatment for simple strictures of comparatively recent origin, not traumatic, and which have not undergone treatment by other means.
>
> "2. It gives very satisfactory results even in cases which do not fulfil all the above conditions, especially if the bougie be left in the stricture from five to fifteen minutes instead of being at once removed. If applied according to rule, it is almost perfectly safe and harmless. It does not take longer than other
> s, the average length of the treatment being twenty-eight days. It has
> t advantage of not condemning the patient to bed, but he can carry on
> employment without intermission during its course. Gradual dilata-
> not be said to *cure* a stricture any more than do the other plans; all

methods of treatment will be followed by relapse unless the patient carries on careful consecutive treatment."

Progressive dilatation, our author owns, is insufficient in cases where it may be necessary at once to restore the width of the canal, and also it is impotent against *irritable* or *elastic* stricture. For these urethrotomy or splitting may be needed.

With regard to the mode and rules for gradual dilatation, M. Curtis recommends the use of gum-elastic bougies, the last to be left in for five minutes or longer, and to be repeated at intervals of two days. Sometimes the interval may be shortened to one day; at another time increased to three or four. Permanent dilatation, by leaving an instrument in the urethra for days together, is condemned in most cases as being comparatively unsafe, and also most certainly and rapidly followed by return of the stricture.

The work is most carefully and systematically written; no point of importance is left unnoticed, and yet it is not unnecessarily verbose or lengthy, and the matter is well arranged and easily got at.

The second work on our list is one of much greater pretensions, and which embraces a large field of surgical work. In it are included not only strictures, but also diseases of the prostate and bladder, including stone, and the operations for its relief. It is a work of much practical value, written by one who evidently has seen a great deal of the surgery of the urethra, and who also is familiar with its literature, past and present. It gives an excellent account of the present position of this branch of surgery, in which the author has himself made his mark, and on some questions has the right to consider himself an original worker and independent authority. It is not an easy book to criticise in detail, but we have marked some passages to which we may briefly allude.

At page 33, urethral fever is described, and the valuable paper by Mr Banks of Liverpool, which appeared in our pages in June 1871, is largely quoted. The author has met with several cases, one nearly as rapidly fatal as the remarkable one Mr Banks records, which cut off the patient in six and a half hours. Mr Gouley lays great stress on the prevention of urethral fever by proper preparatory treatment, which should be adopted for five or six days before a patient is subjected to mechanical treatment for stricture. His plan is as follows:—"After free catharsis, rest should be enjoined for a day or two, a hot hip-bath ordered at night, a diluent drink three or four times daily, ten minims of tincture of chloride of iron three times a day, and five grains of quinine every night."—(P. 38.)

On the subject of dilatation, Mr Gouley, we believe rightly, teaches that to secure or even hope for permanent relief, it is necessary greatly to *over-distend* the urethra—that is, to dilate to a much greater extent than is usually considered necessary, or even possible.—(P. 49.)

The treatment of what the author rightly and scientifically calls *eccentric* strictures—*i.e.*, stricture in which the urethra is carried on, not at the centre, but at the side of the diseased passage—is perhaps the most interesting and most original part of the work. For these cases the author uses slender probe-pointed shafts of whalebone, which can be got into the bladder, and which can then be made use of as guides to a peculiar tunnelled sound, which is figured and described.—(Pp. 53, 54.)

As an example of the brevity which the author can show when on a subject which has no practical value, or more than a historical interest, we quote the following excellent section on Caustic Treatment:—"The caustic treatment so much in vogue in the times of John Hunter . . . and others, I here mention only to say that it is justly condemned by the best living authorities."—(P. 55.)

Some will differ from his views on the question of the effect of splitting on the mucous membrane:—"We should not deceive ourselves by believing that the urethral mucous membrane is only stretched, and that the part torn is the inodular substance in the sub-mucous tissue—an idea recently advanced. I believe that the mucous membrane is nearly, if not always, involved in organic stricture; it should be, and is, torn by the divulsor, union by granulation takes place, and the mucous membrane grows over the cicatricial splice precisely as does the skin over a cicatrizing ulcerated surface; hence the necessity to continue indefinitely the periodical introduction of large-sized instruments."—(P. 61.)

The author's method of external perineal urethrotomy is founded on precise principles, seems easy and certain in execution and results, and in his hands has been wonderfully successful. It varies considerably from Mr Syme's, on which it is so far founded, both in the nature of the conductor he uses, and also very specially in the fact that Mr Gouley does not approve of the retention of a catheter in the bladder even for forty-eight hours. He believes it to be not only unnecessary, but harmful. On the whole, the author's opinion is strongly in favour of the cutting operation in suitable cases—it possible, on a previously passed conductor; if not, without one. Out of 345 cases in the practice of American surgeons (233 of which were done without a conductor), there were 41 deaths. These were chiefly from advanced disease of bladders and kidneys, and from pyæmia.—(Pp. 133–143.)

A large number of cases are pretty fully detailed, illustrating various diseases of urethra. Retention of urine, its causes and treatment, receives full attention. Diseases of prostate are not forgotten. The concluding sixty pages are devoted to a brief but comprehensive *résumé* of our present knowledge of stone in the bladder, and the means used for its detection and removal. Of course it is a mere sketch of the subject, but a good one. We especially would notice the wisdom of the directions as to careful ding, and to the preparation of the patient for being sounded with safety. All hurried operations, after long journeys, and without previous preparation, are strongly to be reprobated.

In our opinion, median lithotomy gets more credit and a larger notice than it deserves, as does also Dolbeau's operation of perineal lithotrity. On the whole, we regard this as a valuable contribution to surgical literature. It is well got up, and the wood engravings are much above the average in point of merit.

On the Constrictor Action of the Intercostal Muscles. By ARTHUR RANSOME, M.D., M.A. Reprinted from the Liverpool and Manchester Medical and Surgical Reports, Vol. II.

THIS pamphlet contains an ingenious theory regarding the much-disputed actions of the intercostal muscles. Starting with the fact that the chord lengths of the ribs in forced, are less than the corresponding measurements in ordinary breathing, Dr Ransome tries to account for this by assuming a combined action of the external and internal intercostal muscles. These, when acting together, will, according to him, tend to diminish the lengths of the chords of the circles, of which the ribs are segments; and, although "the effect of each fibre or of each pair of fibres is necessarily very small, the aggregate power they can exert is probably quite sufficient for the purpose." The arguments adduced in favour of this view are theoretically ingenious; but of the facts themselves, we require more extended proof than the pamphlet affords.

Introduction to the Study of Organic Chemistry. By HENRY E. ARMSTRONG, M.D., F.C.S. London: Longmans.

A Manual of the Carbon Compounds. By C. SCHORLEMMER, F.R.S. London: Macmillan and Co.

THESE books supply what has long been felt as a real and not very creditable deficiency. In French, in German, and in Russian, there have been special treatises on organic chemistry, in which the subject is discussed from many different points of view, but till very lately there was no book of the kind in English. Dr Armstrong and Mr Schorlemmer have now given us what we may call a grammar and a dictionary of organic chemistry. This comparison really very fairly indicates the different characters of the two books. Dr Armstrong, while not omitting the descriptions of individual substances, dwells more on principles and general relations than on details, giving the latter as instances and illustrations of the former. It thus happens that many substances of importance are omitted, either because our present knowledge does not enable us to group them, or because the principles which their properties illustrate are sufficiently illustrated otherwise. The book is carefully and judiciously written, and is a very complete and accurate account of the principles of organic chemistry as held by most modern chemists.

Schorlemmer, on the other hand, deals very shortly with general principles, and devotes the greater part of his book to the preparation, properties, and actions of individual substances. These are shortly but well described, and the result is a valuable book of reference. We cannot avoid expressing our regret that its value has not been further increased by the insertion of references to original papers. We hope the author will take this suggestion into consideration before he prepares a second edition.

Practical Medicine, with a Sketch of Physiology and Therapeutics: Being the Fourth Edition of Meade's Manual for Students. By ALEXANDER SILVER, M.A., M.D., etc. London: Henry Renshaw: 1874. Pp. 606.

IT is indeed a bold thing in the present day to attempt to condense the sciences of Physiology, Pathology, Medicine, and Therapeutics within the compass of less than 600 pages (the remaining pages being index). We need hardly say that Dr Silver's success has by no means been equal to his pluck. An Admirable Crichton could scarcely have succeeded in such an attempt. It is true that Dr Silver desires this book to be judged of solely as a work on the practice of medicine; but in that case he had better have left out the meagre outlines of physiology, which are not above an ordinary school-board standard, and the equally meagre outlines of therapeutics. And even as a work on practical medicine, it is deficient, not merely in fulness of detail—that was unavoidable—but in clearness, precision, and a correct logical statement of the sequence of the facts in the history and diagnosis of any given disease, and without these, condensation is merely confusion. Dr Silver is evidently capable of much better things, but that is no excuse for the carelessness with which this work has been executed. We wonder very much upon what facts Dr Silver bases his statement (p. 207), that when there is cardiac pulsation visible in the epigastrium, the heart lies more transversely than it should do? Where he got the verb to "slower" (p. 210)? What he means by saying that a convulsion may take the place of a chill in initiating inflammatory disease in childhood (p. 254)? Or what he would think of a student coming up for examination who should use his own words and describe the earliest signs of phthisis as fever and emaciation (p. 267)? n, when we have so very definite a disease, if we may call it scites, occurring at times as a local result of local processes,

and at others as a mere part of more general processes, why jumble them all together, to the inextricable confusion of the student? Or why lose sight of the essentials of Addison's disease in the contemplation of its concomitants? But we must stop, for to enumerate the shortcomings of this work, or to attempt to criticize it within the limits at our command, would be to equal the audacity of Dr Silver. We can only regret that his success has not been greater; as, from the number of these small manuals on Practice of Medicine, there is evidently a demand for a work of the kind, and the publisher at least deserves to have a better work. As it is, however, and with all its faults, it is unquestionably better than any other of its size; but that is not saying much, as Hartshorne's "Essentials," Hooper's "Vade-Mecum," and Husband's "Student's Handbook," are those only with which it has to compete.

Foods. By EDWARD SMITH, M.D., LL.B., F.R.S., etc. London: Henry S. King and Co.: 1873. Pp. 485.

BY every thought, by every act we perform, by the mere unconscious action which maintains the balance of life, tissue is continually destroyed, and for its replacement we must supply nutriment or food in some form or other. Hence the importance of a work like the present, designed to instruct us in the various properties of different kinds of foods, and thus to enable us to judge of their value, and of the circumstances in which they are suitable, or of those in which they may be better replaced by others. Upon the whole topic of "Foods" there is no higher authority than Dr Smith, who has made the subject peculiarly his own, and there is no better work than the present. And yet the practical subject of "Feeding" is a very much wider one than that of "Foods," and involves much more complicated considerations than those comprised in the mere chemical constitutions of the articles of food, or even in the definite relations of these foods to the respiration, production of animal heat, or nutrition of the body in certain selected cases of experiment. Hence, the subject of "Diets" or of "Dietaries," for which we must wait a while, is likely to be of much more practical interest than that of "Foods;" and the recent writings of Dr Parkes, on the lowering of the heart's action by a non-nitrogenous diet, and on the influence of a purely animal diet on the removal or causation of certain maladies, have shown how important an influence over disease we possess in our power of altering our patients' diet. While we look, therefore, to the scientific experience of Dr Smith, and those who like him make a study of the subject, for important information as to the best method of attaining our ends, we must never forget that there is a wide world beyond, into which science has not yet entered, and that habit and idiosyncrasy have a very much more important influence on the action of foods than mere chemical composition, and that these circumstances materially influence the utility of certain foods alike in the infant and the adult, in races and in individuals. The actual value of a food therefore often varies very widely from its scientific one; and though, on the whole, we may agree with Sir Richard Jebb, who used to tell his patients that they ought certainly to avoid the poker as indigestible, and the bellows as windy, but that they might eat of everything else in moderation, yet we must often permit a patient to replace what we regard as his normal food with what appears much less so, because the one disagrees in every amount, while he thrives well upon the other. No more striking nor more practical illustration of this could well be found than the sight of a toothless infant, fretful, puny, ill-thriven, alternately purging and constipated, with foul, ill-coloured, and ill-smelling stools, while fed on milk or farinaceous foods, immediately becoming happy, thriving, and in every respect healthy, on a diet of raw beef; except perhaps the equally remarkable fact, that so many of our race are made miserable by tea and coffee, and become healthy and cheerful on a moderate allowance of alcoholic fluids, with an avoidance of their former poisons. The corollary from all this, as well as from much more which we have left unsaid, is simply this, that works like the present are extremely interesting studies of foods from one point of view, but are not in the present state of science to be regarded as efficient, or even always as safe guides in dieting our patients.

An Epitome of Therapeutics. By W. DOMETT STONE, M.D., F.R.C.S., etc. London: Smith, Elder, and Co.: 1874.

THIS is a valuable and interesting book, from the pen of the able Editor of the "Half-yearly Abstract of the Medical Sciences."

The nature of the volume is thus given on the title-page, "A comprehensive Summary of the Treatment of Disease, as recommended by the leading British, American, and Continental Physicians."

"The various diseases incidental to the human frame" are arranged alphabetically, and under each disease are given, in a concise form, the treatment and opinions of the leading physicians and surgeons who are regarded as authorities on that particular disease. The author generally gives the titles of the works containing the opinions of the various physicians and surgeons referred to. The author states that he "claims to himself no further merit than that of judicious selection." He does not in any case state how he considers any particular disease should be treated. He merely places before the reader a concise and distinct statement of the opinions of those best able to speak on that particular disease. Such being the object and nature of the book, it is very evident that quotations from it would be altogether out of place. For the purpose, however, of enabling our readers more fully to comprehend the exact nature and design of the author, we would select one disease, and show how the author proceeds to deal with it. We shall take one selected at random.

Cynanche tonsillaris.—Under this disease Dr Stone gives—1*st*, The opinions of Sir Thomas Watson, as contained in his "Principles and Practice of Physic;" 2*dly*, The opinions of Dr Aitken, as contained in his "Science and Practice of Medicine;" 3*dly*, The opinions of Dr Tanner, as contained in his "Practice of Medicine;" 4*thly*, the opinions of Dr Joseph Bell of this city; 5*thly*, The opinions of Dr Ringer, as contained in his "Handbook of Therapeutics;" 6*thly*, The opinions of Dr Roberts, as contained in his "Handbook of Medicine;" 7*thly*, The opinions of Dr Handfield Jones, as given in the *Lancet*, 7th January 1871; 8*thly*. The opinions of Dr Hartshorne, as contained in his "Essentials of Practical Medicine: Philadelphia, 1871;" and, *lastly*, The opinions of Dr Ellis, as contained in his "Diseases of Children." The author, in rather less than four pages of his book, gives the reader a very good account of the treatment recommended in *cynanche tonsillaris* by these various physicians and surgeons.

The author had a very difficult task to perform. It was next to impossible to make in every case a *judicious selection*, or to introduce all that was really good, and to omit whatever was bad or even indifferent. We believe that many will consider themselves overlooked in not finding their names in this "Epitome of Therapeutics;" and, in some instances, with apparent good reason. Nevertheless, we are of opinion that Dr Stone, on the whole, has performed his task well. The student and medical practitioner will find this book full of valuable information.

The book, however, is not altogether faultless, inasmuch as it contains many errors which ought to have been avoided. For example, we do not consider the following sentence either elegant or grammatical:—"Smoking strammonium, *or* the inhalation of chloroform, *soothe* and *mitigate* the paroxysm in some cases, but *do* not appear to shorten the attack in any." What is the meaning of *various sequila* (page 46)? We might also call attention to *sputa becomes*, page 62; and to the following sentence, page 349:—"When the spasm is the cause of the retention, an anodyne enema, or the inhalation of *chloroform ether*, *are* recommended."

We find in the book numerous instances of the names of medicines being incorrectly spelt,—as, Tr. *Lythæ* for Tr. *Lyttæ; pedophyllin* and *prodophyllin* for *podophyllin; iodidi of potassium* for *iodide of potassium; linimentis aponis* for *linimenti saponis*, etc. Tr. *Hydrociami*, we suspect, should be Tr. *Hyoscyami*. Similarly, we find *tothe* for *to the*, *ercovery* for *recovery*, *sleepness* for *sleepiness; diurectics* for *diuretics*, etc., etc. Such mistakes, although the fault of the compositors, greatly mar the beauty of the book; and should have been corrected as it passed through the press. More serious mistakes are committed in the naming of plants—*Cannabis indica* is correct, not *cannabis Indica*. *Veratrum viridi* should be *Veratrum viride*. We never heard of a plant called *Lactucaria virosa*, although we know well the plant *Lactuca virosa*, and are also well acquainted with *Lactucarium*, the name given to the inspissated juice of this plant. It spoils the beauty of a sentence to speak of some medicines under their English names, and of others under their Latin names in the same sentence, as "turpentine, assafœtida, *oleum rutæ*," etc.; it would have been much better to have said *oil* of *rue*. We see no reason for calling the same drug various names in the same page. We find Morphium, Morphine, and Morphia all used to designate the same substance. In like manner, we object to one word being spelt in three different ways in the same page—"Potass, potassa, and potash."

Whilst Dr Stone deserves great praise for the conciseness displayed in this *Epitome*, yet, in some cases, he has been too indistinct. Under *Albuminuria*, we find the following:—"M. Baudon places on record a number of cases of albuminuria in which the potassium salt failed, and the calcium salt gave good results." It would have been better if Dr Stone had specified the "potassium salt" and the "calcium salt" used by M. Baudon.

We would suggest to Dr Stone that in any future edition of his work, he should use the recognised technical names of the diseases instead of their popular names; for example, for *Consumption* we would recommend *Phthisis*, as being much more professional; and so too in regard to many others.

Medical men, when writing books specially designed for their professional brethren, should endeavour to use scientific language, for by so doing, they would at once advance true science, and at the same time maintain the honour and dignity of the profession.

Notwithstanding these inaccuracies, which we hope to see corrected at no distant day in a second edition, we can highly recommend the book to our readers. It is excellently printed, and, like all the publications of Smith, Elder, and Co., is a very handsome volume.

The Druggist: A Monthly Journal of Practical Pharmacy and Chemistry. New Lebanon, N. Y.

THIS is the second year of this publication. We have before us the numbers for January, February, and March of 1874.

The "Druggist" promises to be a very interesting periodical, and will command, especially in America, an extensive circulation. These three numbers contain several able and interesting papers. We would mention with special approbation an excellent article on "Wines and Alcohol," by Charles A. Lee, M.D.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LIII.—MEETING VIII.

Wednesday, 3d June.—Dr RUTHERFORD HALDANE, *President, in the Chair.*

I. *Dr Matthews Duncan* showed the KIDNEY AFFECTED BY CYSTIC DEGENERATION, removed by Mr A. Campbell of Dundee, referred to at page 36.

II. *Mr Lister* exhibited TWO PIECES OF SUBPERITONEAL FAT, having a most deceptive resemblance to omentum. They were removed from a woman twenty-nine years of age, who had suffered for a year from what seemed an ordinary irreducible femoral hernia. When she walked, the tumour increased to a considerable size, turning upwards and outwards as usual over Poupart's ligament, and she then experienced uneasy feelings in the limb, with a depressing sense of general weakness. On this account she was admitted into the Infirmary, and was there subjected for several weeks to the treatment which used to be advised by Mr Syme, and which, if faithfully carried out, generally overcomes the most obstinate cases of irreducibility, viz., a position of dorsal recumbency constantly maintained, so that by the force of gravity the protruded viscera may be subjected to perpetual gentle traction upwards, while the elevated position favours the subsidence of thickenings and indurations due to congestion and inflammatory hypertrophy; the contents of the abdominal cavity being at the same time rendered as little bulky as may be by a spare diet and frequent doses of castor-oil, and careful taxis being employed about every other day. Under this treatment the main mass of the hernial tumour disappeared, but a portion about as large as a small walnut remained, and became at once increased when she rose. Under these circumstances, it appeared right to cut down in order to ascertain and remove the cause of irreducibility; a practice which, under antiseptic management, had hitherto yielded most satisfactory results. Accordingly, on the 27th ult., the patient having been directed to walk about for a while to cause full descent of the hernia, a longitudinal incision was made which soon exposed what appeared an unusual amount of subperitoneal fat, and on cutting down through this, there was exposed what looked like a hernial sac containing omentum, and the finger introduced into it passed freely upwards through the femoral ring. But on the attempt being made to detach the adhesions of the supposed piece of omentum, it was found that in many parts the apparent sac was extremely irregular and indeed deficient, so that the apparent omentum was continuous with the fat which was obviously extra-peritoneal. In order to ascertain clearly the nature of the protruded mass, it was subjected to gentle traction, when one of the portions now exhibited came down with the utmost readiness, and had, as it was seen, all the appearance of a piece of omentum, being a thin fatty layer six inches long by three broad, with a well-defined somewhat rounded border and apparently serous surface, with transparent patches here and there destitute of fat, yet even in those transparent parts consisting of what looked like two serous membranes, freely movable on each other. Nevertheless, when Gimbernat's ligament had been notched so as to permit perfectly free introduction of the finger, it was found, that although it could be moved about in a wide cavity, and could be pressed against the abdominal wall anteriorly one or two inches above Poupart's ligament, yet, when it was pushed in up to the knuckle, the finger-tip experienced a soft resistance, and when the handle of a blunt hook was introduced, it came to a stop at precisely the same height; implying that it was not in the peritoneal cavity but in an extra-peritoneal space, the evidence thus afforded corresponding with the absence of any continuous hernial sac. The piece of fat which had been drawn down was cut away as well as the other piece exhibited, which was of much the same size, constituting the amount of the protrusion which existed when the tumour was cut down upon. This piece was thicker and had also been a good deal cut and torn in the preliminary stages of the operation, and had therefore lost some of the resemblance to omentum which it originally had. The base of the divided mass of fat was returned through the ring after ligature of its vessels with catgut, and the patient was doing well. The conclusion that the apparent omentum was not such in reality, had been confirmed by microscopic examination; for, not only was no epithelium to be discovered upon its surface, but it was found almost entirely destitute of yellow elastic fibres, whereas the true serous membrane of even the most flimsy portions of real omentum has been proved to resemble other parts of the peritoneum in being peculiarly rich in the yellow elastic element. It was, of course, well known to all practical surgeons that the subperitoneal fat may vary out of proportion to the general adipose condition of the body, and may sometimes deceptively resemble omentum, but it was doubted whether any case had been put on record in which the simulation of that structure had been so perfect as in the present instance.

In connexion with this specimen, it may not be out of place to allude to a curious case which had been operated on by the exhibitor, when Assistant-Surgeon to the Infirmary, several years ago. A man, above middle age, was admitted, with symptoms of strangulated femoral hernia. On operation, nothing but a mass of subperitoneal fat could be discovered, though a careful search was made for a small sac, which might be present in its interior. The patient died, and on post-mortem examination, it was found that there really was no true sac whatever; so, in that case, the patient actually suffered all the symptoms of strangulated hernia, from strangulation of a mass of subperitoneal fat.

Mr Lister also exhibited HALF OF A TUMOUR OF THE FEMUR, weighing nearly ten pounds, removed from a young woman twenty-seven years of age. It had been first noticed ten years previously, and on account of its slow growth and the absence of glandular enlargement, it was regarded as, in all probability, non-malignant, so that, although it reached high up in the limb, it was thought justifiable to amputate below the trochanters, but on the distinct understanding that, if the section of the bone should show any abnormal appearance, the neck and head of the femur should be dissected out. The bone appeared quite healthy where divided, and examination of the growth confirmed the hopes of its non-malignant nature, its structure being for the most part fibrous tissue, more or less ossified, with here and there lumps of pure cartilage, also tending to ossification. Some serous cysts were present in the mass. Unnecessary loss of blood during the operation was guarded against by first emptying the limb of its blood, by elevating it to the utmost in the extended posture, according to the method pursued by the exhibitor for many years past, and then, instead of the aortic tourniquet, using Esmarch's elastic band, applied in the manner first practised by Dr Gibb of the Newcastle-on-Tyne Infirmary, at the suggestion of Dr Page, the House-Surgeon (see the *Lancet*, 31st Jan. 1874). A piece of caoutchouc tubing, about three-eighths of an inch in thickness, was wound tightly three or four times round the waist over a folded towel, placed as a pad upon the bodies of the lower lumbar vertebra, the tube being secured by the simple plan generally adopted by Mr Lister, viz., tying in a bow two pieces of bandage previously tightly tied to the ends of the tube, as in the one exhibited. No arterial hæmorrhage occurred, and very little blood was lost, and, as in Dr Gibb's case, no inconvenience whatever resulted from the tight constriction of the waist. This method seemed likely to have this advantage over the aortic tourniquet, that it would avoid the possibility of injury to the viscera, which might result from the unskilful application of a rigid instrument. More especially was such injury likely to occur when the tourniquet was used for compressing the aorta for aneurism, where the regulation of the pressure was probably left to some inexperienced person, who was apt to suppose that a pulsation in the femoral artery, due to inexact adjustment of the pad, was caused by insufficient pressure, demanding further screwing down of the instrument. And, besides, it must be admitted, that when the aorta deviated more than usual from the mesial line, the adjusting of the aortic tourniquet in the oblique position then required, was a matter of some difficulty.

There was a point in the after-treatment of this case which seemed to deserve mention, viz., the employment of the weight and pulley to counteract a tendency to retraction of the soft parts. This plan had been first adopted by Mr Lister last winter session, in a case of amputation of the leg just below the knee, by the modified circular method, on account of injury. There was just enough skin available in the first instance to form a satisfactory covering; but secondary hæmorrhage took place (a very rare event indeed, after careful ligature of all bleeding points with properly prepared catgut), and, in consequence of this, the wound gaped, and protrusion of the bone threatened to occur. Strips of extension plaster were therefore applied to the skin of the stump, so arranged as not to interfere with antiseptic management, and the result was a perfectly linear cicatrix. In the present instance also, the wound had gaped somewhat, and the bone came nearer to the surface than was desirable. A broad piece of extension plaster was applied to the outer aspect of the stump (the inner side being too short to admit of it), and this being connected with a weight of a pound and a half, just sufficient to do what the hand applied to the skin will do, the covering had proved amply sufficient, and the wound was now almost healed.

Mr Lister also exhibited a specimen of PURE FIBROUS TUMOUR, as large as a small cocoa-nut, from the ham of a young woman. It appeared to have grown from the deep fascia, and its removal involved exposure of the popliteal vein as well as the internal popliteal nerve. Yet, under strict antiseptic management, combined with a free use of drainage-tubes, the patient had been entirely free from inflammatory disturbance or fever, and the large and deep wound had healed entirely in four weeks, without any deep suppuration whatever.

Mr Lister also exhibited a NEW FORM OF APPARATUS FOR PRODUCING AN ANTISEPTIC SPRAY. The importance of the spray, in order to attain anything like constancy of good results from antiseptic treatment, had been plainly proved by experience. But an apparatus worked by hand involved the great inconvenience of requiring a special skilled assistant, both during the performance of the operation and in changing the dressings; or, if the working of the machine was intrusted to a nurse, there was great risk of inefficiency. The apparatus now shown was self-acting and self-directing, being made on the principle of Siegle's steam spray-inhaler, made larger and stronger, and otherwise modified to adapt it for the present purpose. Its nozzle moved on a hinge, so that when placed on a table or bed, it could be directed so that the cloud of spray should be over the seat of operation. It had a safety-valve to prevent explosion when the steam was shut off, and the flame of the spirit-lamp could be varied by turning a nut, so as either to keep the water merely simmering with the most trifling expenditure of materials, or produce full ebullition. One great difficulty had been to provide a window in the boiler to enable the operator to tell when the water was getting low. Different modes of cementing in the glass had failed to resist the combined high pressure and very high temperature of the steam, till at length success seemed to have been attained by means of gum copal, which, at a very high temperature, assumes for a few minutes a perfectly fluid state, so that it could be then run into the junction of the metal and the glass, previously carefully fitted to each other, as a jeweller fits a gem into a ring. The copal thus employed answered perfectly, and the present apparatus had now been in Mr Lister's daily use for three months in private practice, without having shown any sign of leakage. It now only remained for Mr Gardner, the instrument-maker, to make the apparatus according to plans arranged, and the profession could be supplied with what it was anticipated would greatly strengthen the antiseptic system in what had hitherto been its weak point.

III. *Dr John Duncan* then showed, on behalf of Mr Spence, HYDATIDS AND FLUID FROM A CYST, situated among the adductors in the thigh. The patient had been a sheep-farmer in Australia. He had observed the swelling for two years. Within a few weeks it had become painful, and enlarged rapidly. On incision, the cyst was found to have suppurated. The small cysts were exceedingly numerous, varying in size from that of a pea to that of an apple.

IV. *Dr P. H. Watson* showed A THYROID GLAND, which he had recently removed by the operation he had formerly described. The tumour occupied the anterior and lateral aspect of the neck, pushing the vessels backwards, so that their pulsation was felt behind the posterior border of the displaced sterno-mastoids. The tumour impeded respiration, and was a source of great discomfort. The early steps of the operation were effected as usual; but on clearing the tumour from its attachments after ligature of the thyroid vessels, it was found to be laterally and anteriorly closely attached to and surrounding the larynx and trachea. In dissecting close to the trachea, on the right side, a venous trunk was opened and bled freely, but the bleeding was readily checked by pressure with a sponge. On attempting still further to clear the trachea, an opening was accidentally made into its posterior surface, when it was turned up from its bed by the traction upon the trachea. As the bleeding made its way into the air-passages, respiration became much impeded; the tumour was therefore rapidly detached, and all bleeding permanently arrested by the application of ligatures to the open venous trunk. The patient was conveyed to bed, but died in the course of the afternoon, with symptoms which indicated impeded pulmonary respiration. No *post-mortem* was permitted; but as the symptoms, from the time of recovery from chloroform up till the period of death, were only to be accounted for by supposing that pulmonary obstruction existed, the fatal result was due in all probability to the coagulation of the blood in the smaller bronchi and pulmonary structure—a frequent cause of death in cut-throat cases, and after operation upon the fauces and air-passages when fluid blood enters the trachea during the active hæmorrhage. Dr Watson brought this case before the Society as the first fatal case which had occurred in his experience of this operation since his introduction of it. He believed the result attributable simply to the existence of adhesions, and to the unfortunate accident of an opening being made into the trachea. Dr Watson mentioned that he had operated upon another case since this fatal one with complete success, but deemed it important to bring this one source of risk—the only one he had encountered—before the Society.

V. *Dr Joseph Bell* showed THE HANDLE OF A PARASOL he had removed from the bladder of a young lady. It had been introduced to relieve retention from a supposed calculus. He dilated the urethra rapidly, so as to admit the forefinger, aided by which, he easily caught the foreign body by its narrow end by dressing forceps and withdrew it. No incontinence succeeded, nor had the patient a single bad symptom.

VI. *Dr Argyll Robertson* showed AN EYE, which he had recently removed by enucleation from a man, æt. 54, on account of sympathetic ophthalmia. Vision had been lost twenty years before from inflammation, but there had not been much irritation till lately. The eye was useless, and evidently undergoing degenerative changes. On section, it exhibited beautifully a high degree of calcareous degeneration. In reply to a question from Professor Lister, Dr Robertson mentioned that in some cases similar to this, the microscope showed the existence of lacunæ and canaliculi.

VII. *Dr M'Kendrick* then showed A RABBIT UNDER THE INFLUENCE OF HYDROCHLORATE OF CHINOLINE, PREPARED FROM CINCHONIN. The animal was in a state of complete anæsthesia, with relaxation of all the muscles, and remained so for about two hours. The subject of the physiological action of the chinoline and pyridine series of homologous compounds is being investigated by Mr James Dewar and Dr M'Kendrick, and the results will shortly be made known.

VIII. *Dr M'Kendrick* then read his paper on THE PHYSIOLOGICAL ACTION OF CHLORAL AND BROMAL HYDRATES, AND IODOFORM, which appears at page 1 of this Journal.

The *President*, in thanking Dr M'Kendrick for his paper, remarked that it was important physiologically, yet would probably be still more important therapeutically; as yet much was unsatisfactory in our treatment of disease, but he believed a new era was opening to the profession, that we were discovering that the first stages in many diseases were really affections of the nervous system, which acted secondarily on the vascular supply, and which conditions such experimental researches may enable us to treat.

Dr Matthews Duncan had lately under his care a bad case of deep ulceration of the anus and fourchette; he tried iodoform freely, and it had no effect whatever either on the fœtor or the ulceration.

Dr Craig asked if the bromal hydrate had any effect on the secretion from the kidneys. *Dr M‘Kendrick* answered it had not.

Professor Lister asked if there was any relation between the physiological effects of bromal and chloral hydrates on the cerebrum and spine and their *chemical* constitution.

Dr Argyll Robertson alluded to the great degree of contraction of the pupil noticed under the bromal hydrate. He believed it was explained by the combined action of the bromal hydrate in paralyzing the sympathetic, and causing an irritation of the third pair. The effects much resemble those which follow the administration of nicotine to the rabbit. He asked Dr M‘Kendrick if bromal hydrate applied locally to the eye contracted the pupil.

Dr M‘Kendrick answered that the local application was not followed by contraction, only by irritation and lachrymation.

Dr Craig observed that the paper was a most accurate, minute, and careful one, and therapeutists were much indebted to Dr M‘Kendrick for it. On the subject of atropia being antagonistic to the profuse salivation, he mentioned the case of a lady, who, during her pregnancy, had a profuse salivation to the extent of some thirty-two ounces daily, which prevented her from going to church or mixing in society. The use of the tincture of belladonna rapidly caused it to cease. A recurrence of the symptom during her next pregnancy got well under the same treatment.

IX. *Dr Robert Pringle*, Surgeon-Major, Bengal Army, then was allowed by the Society to read his paper on ASIATIC CHOLERA, which will appear in a subsequent number of this Journal.

The President, in conveying the thanks of the Society to Dr Pringle, remarked that conclusions derived from large personal experience were always valuable. The subject was a very wide one. On the whole, he thought Dr Pringle's treatment judicious, though he was doubtful as to the value of castor-oil in cholera, as there is a risk in too great abundance of the discharges; still, he believed the eliminative treatment was the most natural one.

X. *Dr M‘Kendrick* showed an apparatus which he had constructed, by which one could measure with accuracy the interval of time between the impulse of the heart and the pulse in various arteries. It consists of arrangements by which the pulse is caused to form an electric current affecting an electro-magnet. The keeper of the magnet is caused to mark on a cylinder or glass plate moving with uniform velocity. By these arrangements the $\frac{1}{500}$th or $\frac{1}{800}$th of a second may be readily observed.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXIII.—MEETING XII.

Wednesday, 13th May.—Dr J. MATTHEWS DUNCAN, *President*, in the Chair.

I. *Dr Milne* showed a preparation illustrating one variety of BOWEL found in cases of IMPERFORATE ANUS. The bowel terminated in the bladder, near the neck, which was probably about the most frequent arrangement in these abnormal cases. It was said that these cases were exceedingly rare—one in 20,000 or so. He rather thought from his own experience, and the number that had been brought before the Obstetrical Society, that they were more frequently met with. In this case he had incised and endeavoured to reach the bowel, but was unsuccessful. Meconium soon passed by the urethra, showing the hopelessness of treatment. It was only in those cases where the bowel extended to near the normal site of the anus, and where it could be drawn down and stitched to the skin, that we could hope for effective surgical interference.

II. *Dr Milne* read a paper, entitled "ON THE OCCASIONAL ARRESTIVE AND DISCUTIENT INFLUENCE OF PREGNANCY ON PELVI-ABDOMINAL TUMOURS," which will appear in a future number of this Journal.

Professor Simpson said that pregnancy was quite a conceivable method of cure in cases of ovarian tumour. No doubt there were instances, from time to time, of the disappearance of such enlargements. By pressure—by accident, etc.—they were made to burst into the peritoneal cavity, and to disappear. He had published a case where, after tapping, pressure was applied with the best results. The patient had afterwards married, and there were no traces subsequently of the tumour. He believed pressure at least to be a useful way of promoting absorption, cohesion, and, it might be, the entire disappearance of the enlargement.

Dr Duncan said that the question of the cure of ovarian tumours, apart from extirpation, was perhaps one still permitting just difference of opinion, although for himself he had taken a side, and that was against the opinion that a true ovarian could be cured by any plan short of the knife. Dr Milne's cases were interesting, and might seem to favour an opposite view, but they were all confessedly small tumours, and probably not ovarian. It would hardly do to diagnose one as ovarian which was no larger than the size of one's fist. He held decidedly, then, that there could be no cure short of excision, in multilocular growths—and in this he was supported by the records of pathology and practice. Another question occurred, viz., Have we ever such a thing as a true large unilocular ovarian? He had long held that we had not, and the greatest authorities, when consulted, could not prove, but could only express belief, that there were such. Large ovarian cysts, then, are never unilocular. But here we come to a difficulty; there are plenty ovarian cysts called unilocular, but in reality there are in them small cysts, in addition to a large one. It is not the case that all unilocular cysts are small. Now he had to remark that the real unilocular tumours are Wolffian cysts, and he had little doubt but that the cases reported by Dr Milne and others, which had been made to disappear by various means short of extirpation—such as by tapping, pressure, whether of bandaging or pregnancy—were of that kind. He had met with such, and where tapping cured them. Pathologists had for a long period confused the two kinds, but now they were beginning to separate and distinguish them. They could be diagnosed, and in fact tapping was one means, the fluid in the par-ovarian cyst being pellucid and of low specific gravity. In the case of a female possessed of one of these Wolffian cysts, he would not object, any more than Dr Milne, to her marriage, and could conceive of the enlargement disappearing under the pressure of pregnancy. He would just repeat, and he had now had a large pathological experience, that a large non-proliferating ovarian tumour was not to be found.

Dr James Young asked why a cyst of the broad ligament should be readily cured by tapping and an ovarian not?

Dr Duncan said that in the latter case there was an endless succession of them, within the walls of the compound tumour.

Dr Burn said that he had met with several cases of ovarian tumour which had been cured without resorting to ovariotomy. Sometimes they burst and the fluid became absorbed. He had seen pregnancy occasion this; but, on the other hand, he had seen them remain unaffected, either for better or worse, by the gravid condition.

Dr Menzies had also met with not a few cases where, without operation, tumours diagnosed as ovarian had disappeared. He thought he had seen the pressure occasioned by pregnancy produce this result. He remembered of one case in particular, where the tumour was large, yet after successive smart attacks of peritonitis it was cured. He had seen other instances where at least no good was done by pregnancy, and where ovariotomy had to be performed.

Dr Milne replied. He said, that possibly his tumours may have been Wolffian; although he had been aided in his diagnosis by eminent skill. We were probably not yet able to speak dogmatically on the disappearance of these tumours; but there was undoubtedly a growing mass of evidence in favour of the cure of many of them either spontaneously or by the means to which he had referred.

III. *Dr Linton* read the following notes of a case of SUPPURATION OF A DERMOID CYST AFTER DELIVERY:—

Mrs M. aged 36 years, was delivered of her third child on the 21st November last, after a comparatively short and easy labour; in which, however, the forceps had to be used, on account of the feebleness of the pains, the head having remained at the outlet for about an hour. Her two previous labours were natural and easy, and required no instrumental assistance. On the fourth day after delivery she was seized with a rigor, followed by smart pain over the abdomen, which was intensified by pressure, but relieved, and finally made to disappear, by hot turpentine poultices and opiates. She was able to be out of bed by the tenth day, but complained much of weakness, and slightly of abdominal pain on attempting to walk.

In this condition she remained for a fortnight, when, after having been out of doors for a short walk, she was seized suddenly with retention of urine, which was only relieved by the catheter. She was enjoined to keep her bed, and the bladder was emptied in the same way some five or six times, after which she was again able to pass her water voluntarily. Two days after the commencement of the retention, the urine showed a copious deposit of pus, the reaction being acid. The pus, however, disappeared in the course of a few days.

Thinking that some sudden change in the position of the uterus must have occurred and been the cause of this retention, I examined per vaginam, and found the os difficult to reach, and pressing high up behind the pubic symphysis; while lower down and in the cavity of the pelvis was felt a large swelling—about the size of an orange—hard and resisting, quite fixed, and without pain on pressure. My first thought was that I had here a retroverted or retroflexed condition of the uterus, surrounded and fixed by inflammatory deposit; but that supposition was dispelled by the use of the sound, which showed the uterus to be simply raised, with its posterior surface resting against the upper and anterior surface of the swelling. In the lower part of the abdomen, just over the pubic margin, the uterus could easily be felt, as also to its left a considerable amount of hardness. There was more or less pain on pressure over these.

Matters continued thus for about a month, the only noticeable difference being in the size of the swelling, as felt per vaginam and per rectum, which was considerably increased, and appeared softer and more fluctuating.

The patient's strength sensibly diminishing—the pulse remaining quick and feeble, the stomach irritable and refusing food—I asked Dr M. Duncan to see her along with me, which he accordingly did. He diagnosed a suppuration or abscess. A large tumour, very hard, but with some elasticity as if it contained fluid, was felt filling the rectovaginal space, pushing the uterus forwards and upwards. This tumour did not feel like a common perimetritic abscess, for the finger passed per rectum felt that gut separated from the tumour, just as is felt in a case of non-adherent ovarian cyst in the same situation—not the feeling of an abscess or hæmatocele. This feeling of separation could not be made out per vaginam. On the 28th February, Dr Duncan, by exploratory puncture, ascertained the purulent character of the contents of the tumour, which he then freely opened by bistoury.

The amount of pus collected on opening the abscess was 24 ounces. It was impossible to collect any afterwards, but the quantity for the first week was very considerable, and even now (18th April), seven weeks after the operation, there is a copious discharge of thick yellow pus.

Passing his finger into the cyst, Dr Duncan easily made out its real nature, feeling in it a mass of hair and several bits of bone, of which one was as big as the nail. Seizing this mass of hair by a forceps, he extracted it and the bone as well.

The mass of loosely convoluted hair is of a light yellow colour (the woman's being dark), and of the size of an orange, only it is not so spherical, having an elongated spheroidal shape. About it is much fatty matter, the latter being deposited in a thick layer over one side of it. The hairs are of different lengths—the majority seeming to be about two inches long. (They were not examined to ascertain whether they possessed bulbs.) Passing through the upper part of the mass is a fibrous cord, scarcely so thick as a goose-quill, which appears to have stretched across from one side of the cyst to the other. Its extremities are large and irregular, and ragged in their margins, and seem to consist of portions of the walls of the abscess torn away in the extraction of the tumour. Within these expanded ends the cord is hollow to the extent of a little more than half an inch, but throughout the rest it is solid, no air being able to pass.

25th April.—The discharge is now very slight, and the opening made, which three weeks since would admit the point of the finger, cannot now be felt. On examination per vaginam, the os uteri is found occupying a position about the centre of the pelvis, and surrounded by much hard swelling, and appears immovable unless when pressed from above the pubes. Per rectum, the posterior surface of the swelling can be felt, along with a fold as if from bowel passing across it; while to its left, and apparently in connexion with the left ovary, is a swelling about the size of a walnut, having a smooth and elastic surface.

Though still very weak, patient has been able to be removed to the country.

Dr Burn said he had seen three cases of dermoid cyst. After opening, some of them took six or eight months to heal up. The contents were usually hair, teeth, etc. In one which was opened by Sir James Simpson, the woman got on well, and had a child afterwards. In another the woman has not had children for some considerable time.

Part Fourth.

PERISCOPE.

THE FUNGUS OF ALOPECIA AREATA.—In 1843, Gruby described the affection of the hairy scalp, known as *Alopecia areata*, as a parasitic disease caused by a fungus, to which he gave the name of *Microsporum Audouini*. He was confirmed by other observers, and especially by Bazin. But as the fungus could not be found, and its existence, therefore, denied by Barensprung Hebra, Wilson, Neumann, Böck, Duhring, Scherenberg, and Kaposi, and as later Bazin himself seemed to doubt the accuracy of his first observations, the parasitic nature of the disease might be considered to have been completely given up, except, perhaps, in Paris.

In the Archives de Physiologie (Mars, Mai, 1874), a note by Malassez, "on the fungus in Alopecia areata," vindicates the accuracy of Gruby's original observation in its essential features, thus illustrating in a striking manner the danger of dogmatizing from negative results.

The patients from whom Malassez obtained his preparations were under the care of Laillier, at the St Louis. He examined scales scratched from the epidermis of the bald patches, where the fungoid spores were found most easily, and the hairs and sections of the epidermis itself. Grease was removed by ether or absolute alcohol, and after additional treatment by alcohol, the scales were mounted in 1 per cent. solution of carbolic acid, the hairs and sections of epidermis in equal parts of glycerine and water, which in the former case was slightly acidified by acetic acid.

The author thus sums up his results:—

There exists in (*Alopecia areata*) *la pelade* a parasitic fungus. This fungus occupies the most superficial parts of the horny layer of the epidermis. It is found between or on the cells of this layer. It is only met with accidentally on the hairs, and in this case is on epithelial cells which come from the cutaneous epidermis. It is exclusively composed of very small spherical spores. Of these, three types are to be distinguished:—

1st. The first measure from 4 to 5 μ., have a double contour, and may have buds. These are the larger spores.

2d. The second measure from 2 μ. to 2·5, have no double contour, and may have buds. These are the small spores.

3d. The third have a diameter inferior to 2 μ., a simple contour, and no buds. These are sporeless.

The ovoid spores which are also met with, are not special to the disease, and appear to belong to another species of fungus. There are no tubes (*mycelium*), but simply beaded rows of five to six spores at most.

These results confirm the discovery of Gruby in all that is essential, but they differ from his description completely in some points of detail.—*Archives de Physiologie*, Nos. 2 and 3, 1874.

R. JANSCH, *A case of Pregnancy in a Rudimentary Horn of the Uterus; Death by Hæmorrhage; Transmigratio Seminis extra-uterina.* (Virchow's Archiv, 1873, lviii. 185-203).—The author brings a contribution in answer to the question, If a stunted supplementary horn can be the seat of a development of the ovum, even in a case in which communication with the cavity of the developed uterine horn must be excluded? A woman, aged 27, who had given birth, normally, three years previously, had not menstruated for four months when she fell sick with the most violent symptoms of an effusion into the peritoneal cavity. The passage of fragments of decidua lead the diagnosis to the right etiological cause. Death thirty-six hours after the attack. Blood coagula were found in the pelvis, and in the midst of them the following:—From the vagina towards the right stretches the cylindrically formed uterus, "from the point of which the appendages of the right side take their origin." The rudimentary left uterine horn is connected with the left convex border by a broad thin band. In shape and form it is very like a hen's egg. The appendages of the left side, the round ligament, pervious tube 12 cm. long, ovary with corp. lut. ver., are present, normally. The placenta, with membranes and fœtus, are applied mushroom-like to the stunted horn. The fœtus corresponded in development to the sixteenth or eighteenth week of pregnancy, and was a male. The weight of the placenta and rudimentary horn was 350 gm.

Most deserving of consideration is the already mentioned ligamentous bond of union between the supra-cervical part of the normally developed horn and the right side of the rudimentary uterus. It was 8 cm. long, and contained fine bundles of smooth muscular fibre, and a very narrow canal lined with ciliated epithelium.

The author excludes decisively the idea that the obliteration of this canal, which was in the direction of the normal horn, 2 cm. long, and was absolute, had taken place during the pregnancy, and sees himself, therefore, compelled, in order to explain the fœtation of the left supplementary horn, to assume a "transmigratio seminis extra-uterina."—*Centralblatt*, 1874, No. 13.

L. PERL, *On the Influence of Anæmia on the Nutrition of the Muscles of the Heart.* (Virchow's Arch., 1873, lix. 39-51.)—The observation of Ponfick, that the combination of fatty degeneration of the heart with anæmia, was frequently preceded by considerable losses of blood, induced the author to determine experimentally if this degeneration stands in connexion with the anæmia so caused.

In a first series of experiments, he practised on dogs large venesections at long intervals (every five to seven days, 3 to 3½ per cent. of the actual weight of the animal); in a second series, more frequent and smaller venesections (every three to four days, 1 to 1½ per cent.).

The operations were well borne by the animals: the wounds healed regularly without fever. Only in one case was there embolism of the lung.

Whilst the six animals of the second series, on whom in minimum ten and in maximum seventeen venesections were practised, remained quite lively, and when killed, thirty-six or thirty-nine days afterwards, did not show the slightest alteration of the muscular substance of the heart; on the contrary, the seven dogs of the first series, on whom five to seven venesections were practised, gradually became much emaciated, lost their appetite, were depressed, became partially œdematous in the extremities, and died at last within eleven weeks and with all the appearances of marasmus. With the exception of a single animal that died, after four weeks, in all the others the heart was found flabby and of a clear yellowish colour. On microscopic examination, the known appearances of an exaggerated fatty degeneration were found in a great number of the muscular fibres. These fibres lay irregularly distributed between others that were still normal in greatest numbers in the papillary muscles, especially of the left ventricle. In the absence of any other cause, these changes may be considered as due to the abstractions of blood, and the anæmia thereby produced.—*Centralblatt*, 1874, No. 15.

PANAS, *On Section of the Buccal Nerve from the Mouth.* (Archives Génér. de Méd., Février 1874.—The nervus buccalis is a mixed nerve which is not seldom the seat of violent neuralgia. Yet it has hitherto been divided only six times, either from the cheek inwards, after Michel, or from the mucous membrane of the mouth, after Nélaton.

The author publishes a seventh case, in which he operated from the mouth.

The patient, a woman 65 years old, who had for twelve years suffered from violent attacks of buccal neuralgia, submitted to an operation after having tried in vain remedies of the most diverse kinds. Panas operated as follows:—

The corresponding corner of the mouth is drawn strongly outwards. The operator feels with the index finger of the left hand for the external ridge of the ascending ramus of the lower jaw, and makes over it an incision 2 to 2½ cm. long, from the last upper to the last under molar. After separating the mucous membrane, the horizontally running fibres of the buccinator muscle are seen, which are divided. Outwards from the muscle is found the nerve, which is freed and cut. The result was, a month after the operation, per-

fect, although before the operation an influence on other nerve tracts—at times, those of the second branch of the trigeminus—had taken place.—*Centralblatt*, 1874, No. 17.

JABORANDI.—In the *Journal de Thérapeutique* for March 1874, there occurs a notice of a "new medicine, diaphoretic and sialagogue, the *Jaborandi* of Brazil," by Dr Continho of Rio Janeiro.

Jaborandi, the name given by the Indians to this new medicine, is a shrub which grows in the interior of certain provinces of the North of Brazil, and whose leaves resemble those of the laurel of Apollo. The leaves have no odour except when bruised, but then they exhale an aromatic odour. Their taste is slightly acid, without any bitterness, and unlike that of any other plant used in medicine. The leaves and small branches are bruised, and from four to six grammes are infused in a cup of hot water. Ten minutes after a cup of this infusion has been administered, there comes on an abundant secretion of saliva—to such an extent that a litre and upwards has been collected in the space of two hours; and frequently the patient can scarcely speak on account of the abundance of liquid in his mouth. The bronchial secretion is not less abundant, and so great is the perspiration, that the patient has frequently to change his linen in the course of a few hours. One patient, to whom had been administered a cup of this infusion, compared the effects produced to an "internal vapour-bath." The effects continue for four or five hours. It is not necessary to administer this drug hot; it produces its effects even when given cold; and, unlike sudorifics generally, it is in no way dependent on the rise of temperature in the body for the production of its effects. It appears to act by directly stimulating the sweat-secreting glands.

In an article in the same number of the *Journal de Thérapeutique*, Professor Gubler of Paris confirms the assertions of Dr Continho, and says that the effects of Jaborandi are extremely remarkable, and the evidence irresistible. This medicine has been tried a sufficient number of times at the Hospital Beaujon, and has always shown itself a powerful diaphoretic, and an incomparable sialagogue. He tells us that in a few minutes after the medicine has been taken, the sweat is streaming over the face and whole body. The saliva flows in great abundance, and the bronchial secretion is greatly increased. In two cases there was diarrhœa.

One of Professor Gubler's pupils, who perspires with great difficulty, perspired very abundantly after drinking a single cup of the infusion of Jaborandi scarcely hot. He recommends it in the early stages of affections arising from cold; in bronchitis, diabetes, and dropsies, and in maladies due to miasma and morbid poisons, as the eruptive fevers.

Much speculation exists regarding this remarkable plant. Some maintain that it belongs to the Piperaceæ, others assert that it belongs to the Rutaceæ, but there is no sufficient reason for believing that it belongs to either of these natural orders. No doubt, many plants belonging to both these natural orders are called by the Indians of Brazil Jaborandi; but it must be borne in mind that Jaborandi is a name given to plants on account of possessing stimulating properties, and not because of the botanical characters which they possess.

This much appears to be established: The leaf is what botanists call a compound leaf—impari-pinnate—occasionally more than three decimetres in length. The leaflets are eight to ten in number, ten to twelve centimetres in length, and three to four centimetres in breadth. The leaflets are scarcely opposite, oval, elongated, elliptical, emarginate, and slightly unequal at the base, like the leaves of the genus *Ulmus*. They are glabrous, smooth, somewhat thickened, and brittle when dry. They are shortly petioled or nearly sessile. The petiolule is cylindrical, and scarcely thickened at the point of insertion into the common petiole.

From the leaf alone it is quite impossible to determine the order, far less the genus or species, of the Jaborandi; and we must remain in ignorance of the plant which yields this remarkable medicine till we procure the flower and fruit of the shrub.

Dr Continho, who is a distinguished botanist, has promised to publish shortly a work on the actions and uses of this interesting medicine, giving the natural history of the plant, its botanical characters and its chemical analysis, illustrated with drawings of the entire plant.

M. Rabuteau has made a chemical analysis of the leaves of Jaborandi, and has come to the conclusion that the leaves contain—

1. A volatile principle; 2. A part soluble in water, and perfectly flavourless; 3. A part insoluble in water, but soluble in alcohol, and having a bitter flavour; and by experiments he has come to the conclusion that it is the last of these three in which all the virtues reside. It is the bitter alcoholic extract alone which possesses the power of producing the remarkable effects of Jaborandi.

SYPHILITIC MULTIPLE HERPETIFORM CHANCRE.—In the *Gazette des Hôpitaux*, 28th April 1874, a variety of the initial manifestation of syphilis is described by Dr Dubuc. He acknowledges the usual classification of primary syphilitic sores—*1st*, The superficial erosion; *2d*, The true indurated chancre. Dr Dubuc places the herpetiform variety of chancre under the first of these divisions.

The chief peculiarities of this form of chancre are: its multiplicity, the foliaceous form of induration, and its liability to be mistaken for herpes.

The chief distinctions between this variety of chancre and herpes are: its progress is more tedious; the colour is darker, like muscle; and, lastly, that the circumference is more regular than that of herpes, which has usually a polycyclical circumference composed of segments of circles. There is no peculiarity in the prognosis or treatment.

M. Aimé Martin makes the following observations with reference, to Dr Dubuc's paper, in the same journal, 5th May. In his eyes, the herpetiform chancre does not constitute a real variety, all its characters being found to appertain to the infecting chancre, which, according to M. Martin, is multiple, at least four times out of five. He admits the great difficulty that would exist in the diagnosis between this form of chancre and herpes at first, and thinks it would be necessary, before coming to an opinion, to wait till the specific induration and adenopathy had shown themselves. The polycyclical grouping of herpetic ulcerations does not appear to him to be sufficiently constant to furnish a precise and absolute indication. The diagnostic points which appear of most importance to M. Martin being: the surface of the ulcerations, which in the infecting chancre are covered by an adherent false membrane; the edges are deep-red, they bleed easily, but suppurate very little. In herpes, on the contrary, there is no adherent secretion. The surface of the ulceration is of a bright-red colour, and suppuration is generally abundant. Finally, the ulcerations of multiple infecting chancre are indolent, whilst those of herpes are usually the seat of sharp pain.

OXYGEN FOR AERONAUTS.—It is well known that in balloon ascents to a very great altitude, the travellers suffer much from the diminished pressure of the atmosphere, and find it difficult to support existence. M. Bert has lately experimented on this subject; and proved that by breathing oxygen, such difficulties in respiration might be avoided or lessened. The results obtained by MM. Croce-Spinelli and Sivel, on board the Polar Star, confirm this theory. They gained a height of 7400 yards, with a pressure of 30 centimetres, and cold equal to 22° below zero. Two different mixtures of oxygen were used: one containing 40 p. c. of oxygen to 60 of nitrogen, was used up to 6000 yards elevation; the other, of 75 p. c. of oxygen to 25 of nitrogen, in the higher altitudes. The effects on M. Croce-Spinelli were most marked. Without the oxygen he could only crawl in the bottom of the car, and make his observations fixed in that posture; on the other hand, after breathing it, he seemed to be re-born, and after a dozen inspirations he could rise, chat gaily, look at the sun with attention, make delicate observations; his intelligence was sharp, and memory excellent. To make spectroscopic observations, it was necessary to inhale the gas, when the eyes, confused before, became clear and distinct. M. Croce-Spinelli proves that the few observers who have ascended to such great heights have been under an illusion in describing the colour of the sky as a bluish-black; this must be a result of feebleness of vision, for, after inspiring the oxygen, the colour appears no darker than it does on the earth's surface. Eating, which is almost impossible without the oxygen, becomes easy with it, and appetite and digestion were both improved. The pulse was 140 before the inspirations, and 120–128 after them.—*Journal de Médecine et de Chirurgie Pratiques*, May 1874.

THE following interesting account of Mr Gutteridge's operation for stone is from the *Medical Times and Gazette* of 15th Nov. 1873:—

Mr Gutteridge's scheme consists of two parts, viz.—to use his own words, "of a due combination of incisions of parts ascertained by extended experience to be capable of being safely severed; and of implements with which the successive stages may be most surely and with least danger accomplished." The patient was a boy sixteen years of age, a native of the Black Country, and was submitted to operation without being anæsthetized, as Mr Gutteridge has a strong objection to chloroform or ether in lithotomy. Kneeling before the patient when in the lithotomy position, and with his eye thus in a line with the perineum, the operator first passed the staff, which he handed to his assistant; he then made very firm pressure with the fingers of his left hand upon the anus, thus dragging the skin of the left side of the perineum, with the lower extremity of the gut, well over towards the right tuber ischii. He next rapidly plunged the scalpel into the groove of the staff at a point a little to the left of the raphe, and on a level with the anterior extremity of the tuber ischii, and then, without running the scalpel along the groove, he made it cut its way through the soft tissues. Next he passed the beak of the cystotome into the roughened groove, and with the cutting edge directed a little upwards from the horizontal direction, he passed it onwards through the prostate, and then turned the edge downwards and brought it out at the lower extremity of the skin-wound. This done, he passed his left index finger into the bladder, felt the stone, then withdrew the staff, and passed in along the finger a grooved conductor, much like a narrow blunt gorget, and along this, after withdrawing the finger, he guided the forceps, only one blade of which was *in* the groove of the conductor. The stone was seized and at once withdrawn, and the operation thus completed.

It will be understood from this account that the method differs from that adopted by other surgeons in that (1) no anæsthetic is administered; (2) that in dividing the structures in the ischio-rectal fossa, the scalpel is thrust by one plunge into the groove of the staff at the point of the anterior extremity of the wound, and that, owing to the traction made on the anus, the incision through the skin, when the parts are relaxed, is seen to extend over the tuber ischii; (3) that the incision whereby the bladder is opened is semilunar in shape, and describes a curve constituting an arc (as Mr Gutteridge states it) of 100 degrees of a circle; (4) that the forceps are guided into the bladder along a grooved director instead of along the left index finger. Mr Gutteridge spares, if possible, the membranous portion of the urethra, and lays open only the prostatic part. His aim is to make his knife enter the canal at the apex of the prostate gland.

For these modifications in the procedure, special instruments are provided. These were recently shown to members of the British Medical Association, at the forty-first annual meeting in August last, a description of which Mr Gutteridge has himself given as follows:—"A table constituted of a fixed frame, on which is a sliding top, whereby the patient may be firmly fixed and kept symmetrically in all respects, and yet through which, by means of a simple screw action, the position of *tight-up trussing* may be speedily relaxed, and the pressure on the respiratory and venous systems lightened, so that in a protracted operation rest may be given and renewed efforts made, by intervals, at the operator's pleasure—a resource in the aged and the fat of the very first importance as respects the sustaining the patient's power of endurance without fatal congestion. The manual instruments consist—first, of a staff, with handle capable of being used by the operator and the assistant at the same instant of time, and with a furrow for the knife to traverse, coiling slightly, and roughed so that the holder of the knife may have a positive assurance of the knife and staff being in real contact throughout the course of the knife, until it is entered into the bladder. Secondly, an implement consisting of a handle shaped for the finger and thumb, with scalpel mounted at one end; and at the other a beaked knife—properly a cystotome—fixed at a right angle to the scalpel on the axis of the haft, so that one instrument may effect, by a move of the finger and thumb, the two distinct incisions, the external one and that of the prostate. Thirdly, a conductor for the forceps conformable in respect of size to the operator's left forefinger. Fourthly, forceps with supplementary handles by which the stone may be compressed with hair-light pressure while increased force is brought to bear on the main arms of the forceps, admitting of the separation of the process of compression and traction, as well as relaxation of the hold of the stone, for the purpose of adjustment of the forceps to the stone, or gentleness of pinch, in case of the stone being of friable material."

The operation for stone performed with these instruments and in this way Mr Gutteridge would desire to have known as "lithotomy made speedy and safe." Certainly, in his own hands, when performed as we saw it, it is grihtly so styled. It was done in a remarkably short time—less than half a minute—and every step in the operation was executed with rapidity and precision. The boy has gone on perfectly well since the operation, and within forty-eight hours afterwards the urine was all voided by the natural passage. This, as is well known, is an unusually short time between the operation and the safety of the patient, which is secured by the flow of urine along the urethra. Yesterday, the eleventh day after the operation, the patient returned to his home in Staffordshire perfectly cured. We sincerely hope we shall have other opportunities of seeing Mr Gutteridge cut for stone.

TRIPLE AMPUTATION.—Sarah Wells, a coloured girl, aged nine years, while riding upon the foot-board of engine No. 1, Kansas Pacific Railroad, 11th October 1873, accidentally fell under the wheels, which passed over both arms and one leg. I was immediately summoned, and found her in a frightful condition; covered with blood and dirt, and with three limbs nearly crushed from the body. I called Dr William H. Thacker to assist me. Chloroform was administered at once, and the right arm amputated about two inches below the elbow; the left one at the point of union of the upper and middle third of the humerus; and the right leg about four inches below the knee. The amputations were performed, and the limbs dressed, within a less period than one hour from the reception of the injury. The shock following was not as great as expected from the extent or nature of the wounds. There was union by adhesion in the upper extremities, but in the leg considerable sloughing took place. Cicatrization, however, was accomplished at the end of the seventh week. The dismemberment of so large a portion of the body, the speediness of the operations, and the favourable results attained in the case, would seem to me to give it some importance to the profession as additional evidence in favour of immediate amputations. F. J. BANCROFT, M.D. —*Philadelphia Reporter*, 2d May.

THE following seems to be a most legitimate and valuable application of Esmarch's method of stopping hæmorrhage:—

ESMARCH'S "BLOODLESS METHOD" EMPLOYED FOR THE EXCISION OF A SCROTAL TUMOUR. By Surgeon-Major H. CAYLEY, Civil Surgeon, Cuttack.—A man of about 35 years of age was admitted with an ordinary scrotal tumour of the size of a child's head. The hypertrophy involved the entire skin of the penis and prepuce and both sides of the scrotum. There was also a hydrocele of the left side, but not on the right. The disease had been growing for three or four years. The operation was performed as follows:—The elastic bandage, lent me by Dr Fitzpatrick, who kindly assisted me in the operation, was firmly bound round the entire tumour, including scrotum and penis. The indiarubber tube or cord was then firmly wound round the narrow part or neck of the tumour and tied, and chloroform was at once given. As soon as the man was under its influence the elastic bandage was removed, leaving the indiarubber tube. I then cut freely down upon and entirely dissected out the penis and testicles, and united the incision across the pubes in front. During all these stages of the operation, although one could see the enlarged vessels divided and their mouths gaping, not one drop of blood was lost; the surface even of the knife was not stained with blood. The cut tissues were perfectly white and almost dry. It was necessary to remove the indiarubber cord before cutting off the mass of the disease, in order to get quite behind the disease in the perineum, but this last stage of the operation can be done so quickly with a few bold sweeps of the knife, and the vessels can be so rapidly held by the finger of assistants until they are ligatured, that very little blood need then be lost, and in the present case the bleeding certainly did not exceed five or six ounces. There was a little bleeding a few hours afterwards from one artery that had been twisted and not ligatured; but this was easily secured. The wound is now, seven days after the operation, beginning to granulate healthily, and the case doing well in every respect. The great advantage of the method in this operation is, that during the first and most difficult stage—that of dissecting out the penis and testicle, when the bleeding is generally most profuse and troublesome and difficult to control—the operation was absolutely bloodless, and I have no doubt that in many cases where the margins of hypertrophied skin are well defined the indiarubber tube need not be removed until the entire tumour has been amputated, and the operation would then be bloodless up to the moment of securing the vessels.—*Indian Medical Gazette*, 6th May 1874.

TREATMENT OF BURNS.—Some years since, one of the members of my family was unfortunately badly scalded over the face, head, neck, arms, and chest, by the explosion of a boiler. I then had ample opportunities of testing the relative advantages of the many applications in vogue for burns. The carron-oil, I found, was very annoying, on account of its unpleasant and sickening odour. Especially was this the case when applied upon the face. A medical friend suggested to me a preparation which gave great satisfaction at that time, and which I have since largely used. I will show you how to mix the materials. I have here a saucerful of lard; I run some water from the spigot over it, stirring it at the same time with a spoon, so as to get rid of the salt. Here is a bottle of lime-water, sixteen ounces; into this I drop two drops of the bitter oil of almonds and shake it well. The lime-water has now an agreeable odour. I then pour into the lard, from which I have already drained off the water, about three or four tablespoonfuls, or a little more, of this prepared lime-water. I then beat up the lard with a spoon until the lime-water is incorporated. I have thus a sort of carron-oil, composed of lard and lime-water, possessing a pleasant odour, and which can be freely applied, even over the face, without producing any unpleasant sensation. It is cooling, cleanly, and agreeable, even to the most fastidious. I spread this mixture on a cloth, and adjust it upon the burned surfaces. I usually change this dressing once or twice a day, taking care, of course, not unnecessarily to disturb the surface of the burn. I advise you, gentlemen, to remember this simple application, and I am quite sure that you will be greatly gratified by its excellence and soothing qualities. I have spoken thus of a local application alone. Of course, in severe burns, you will see to the alleviation of pain by proper anodynes, and to the sufficient support of your patient in cases of exhaustion.—Extracted from Surgical Clinique of Dr J. H. Brinton, from *Philadelphia Reporter*, 6th June 1874.

ON THE SURGICAL USE OF GASTRIC JUICE IN THE TREATMENT OF CANCEROUS TUMOURS.—Professor Lussana, after several years of experiments and observations, has arrived at the following conclusions:—Gastric juice applied to these tumours softens their tissues, but its action is not powerful enough to arrest the progress of the disease. 2. That natural gastric juice is more reliable than the artificial. 3. It does not destroy the vascular tunics, but arrests local hæmorrhage produced by the destruction of tissues. 4. The gastric juice of dogs was found to act slowly; indeed, it did not much retard the development of the tumour. 5. There is a continuous exhaustive loss of substance during treatment, and it is probable that though the cancerous elements are dissolved by this remedy, the further extension of the disease is not prevented.—*Giorn. Ven. di Sci. Med.*, Sept. 1873; quoted in the *N.Y. Medical Record*, 15th Dec. 1873.

Part Fifth.

MEDICAL NEWS.

REPORT ON THE TREATMENT OF LEPROSY WITH GURJUN-OIL.—Surgeon-Major J. Dougall, M.D., Officiating Senior Medical Officer at Port Blair, in the Andaman Islands, has published a most interesting account of his method of treating leprosy with gurjun-oil. His success has been so remarkable, though so short a time as one year has elapsed since he began treatment, that some of our highest medical authorities are impressed with the value and interest of his method of treatment. Space forbids us from inserting the whole of it, but our readers may judge for themselves from the following account of the paper:—

Soon after Dr Dougall's arrival at Port Blair in March 1873, the question of the treatment of the leprous convicts forced itself on his attention. He found twenty-four under treatment, most of them exceedingly aggravated and advanced cases, all with the blank and hopeless look, conveying to his mind the idea of a living death.

They were convicts, their food was insufficient, and their surroundings naturally of the most economical character. Their medical treatment had been the application of carbolized oil to their sores;

they were washed daily with water, and bran was used as a detergent. In spite of this, discharges were profuse and offensive, and the flies which settled on the patients were a perfect pest and annoyance all day long. One poor fellow had to lie constantly in a corner under a blanket, to keep off the flies, which rose in a cloud from it when he moved.

On considering what was to be done, the Beauperthuy treatment was considered, but presented many difficulties. "In the first place, the hygienic treatment—which is absolutely essential, and without which nothing but the most temporary improvement can be attained—consists of pure air, nourishing food, including a moderate quantity of fresh meat daily, abstinence from all salted meat or fish, and from pork whether salt or fresh; a sufficient quantity of fresh vegetables must be given, and if the patients are habituated to its use, a moderate quantity of light wine may be given; but this is not necessary. The external applications consist of soap-and-water baths twice a day, and frictions over the whole of the skin with oil. Oil of cashewnut is also applied to the tubercular formation by means of a small piece of sponge. When the feet are affected, and it is not convenient to use the cashewnut-oil for them, baths of hot cocoanut-oil may be used night and morning; these must be superintended by a skilled attendant, who tests the heat with a thermometer. Now, to get all these means of treatment for twenty or twenty-five convicts seemed to me rather a formidable undertaking; even procuring the moderate quantity of fresh meat daily would have been attended with difficulty in a place where we pay thirteen annas for the pound of mutton. Abstinence from all salted meat would have been an easy matter to insure, because the patients never got any meat at all, salt or fresh; abstinence from fish could have been managed, I have no doubt; but then they get fish four times a week. It is needless to enumerate the difficulties that would have to be overcome in getting soap-and-water baths daily twice a day; still they could have been got, and cocoanut-oil too. However, all these means of cure, though attainable, seemed to me impracticable, and I thought that if anything was to be accomplished, it ought to be, if possible, with remedies obtainable in this settlement, and not of an expensive kind. Two months passed before I had made up my mind to anything definite, and at last I determined to try the oleo-resinous substance obtained here in abundance from the Dipterocarpus lævis and other trees of allied genera. After obtaining some of this oleo-resinous substance (which is known in commerce as gurjun-oil), I found, on rubbing it on my own arm, it was so sticky that it was not in a condition to be used without a solvent. I then had it rubbed in a mortar with cocoanut-oil and found that the two mixed well, and by this combination the gurjun-oil became quite manageable, though still slightly sticky. It combined still better with castor-oil, and when mixed in equal quantities it became quite palatable, and removed all disagreeable after-taste from the castor-oil."

As supply of castor-oil was limited, various plans of using the gurjun-oil were tried in succession; first, one to ten, and afterwards one to five, of cocoanut-oil. Soon they were ordered to get the oil internally as well as externally, beginning with six-drop doses, gradually increased to sixty, of the pure gurjun-oil.

Treatment was commenced on 23d May 1873, and by the beginning of July it was evident that improvement had commenced, and then the lepers were photographed.

After rubbing for some time with the cocoanut and gurjun oils mixed, other combinations were tried; first, an emulsion of carbonate of soda and gurjun-oil, which made an excellent soap, and was easily rubbed on the body, but caused smarting on face and eyes. In September it was discovered that lime-water three parts, mixed with one part of the oil, by violent agitation, formed a substance of the consistence of Indian butter, to which the name gurjun-ointment has been given. It can be made in an ordinary churn, rubs on smoothly, and without pain or blistering even on healthy skin, and it has no bad smell. With a smaller quantity of lime-water it makes an excellent emulsion, of which each leper takes half an ounce night and morning.

The plan of treatment now pursued with the lepers was as follows:—"They turn out at daylight (say 5.30 A.M.), after a little time they supply themselves with a small quantity of dry earth finely pulverized, which is kept ready in a tub under the hospital; with this dry earth they all proceed to a small stream in the neighbourhood, where they thoroughly wash themselves, using the dry earth as a detergent; having accomplished this task, they return to the leper ward by 7 A.M., where they sit in a row, and each man is then served with his morning dose of four drachms of wood-oil and lime-water mixed in equal proportions. Having seen this swallowed by all of them, the apothecary sees that each man has some small vessel (usually half of a cocoanut-shell), into which the compounder puts a quantity of the gurjun-ointment, and with this they proceed to rub themselves all over, not merely by smearing it on, but thorough and continuous friction is kept up for two hours, and the compounder all the while is walking up and down the line armed with a tin of the ointment and a spatula for distributing more of it as it is required amongst the patients; and no limit is placed upon the amount given, further than that whatever is given must be well rubbed in. The rubbing is thus continued till 9 A.M., then the men set about getting their food, and latterly they trim the ground around their own quarters and excavate earth-work; and it is pleasing to see the will with which men who for years had not been able to handle a walking-stick on account of loss of fingers and numbness in the arms now set about this sort of work, and they are evidently proud of being again able to work when such a hope had been abandoned long ago. At 3 P.M. the lepers fall in, and get their second dose of half an ounce of the gurjun-emulsion internally, and then the gurjun-ointment is supplied to them as in the morning, as already described; the rubbing is kept up from 3 to 5 P.M. The prolonged rubbing is not only insisted on for the sake of the action of the ointment upon the skin, but because I consider any gentle employment combined with exercise is beneficial both physically and mentally: by physical exercise the whole system is improved in tone, and the mind is benefited by their attention being withdrawn from their former hopeless condition, and they are led to compare the present with their past."

A detailed report is given of the results obtained in all the twenty-four cases and another new one. In *all*, great improvement has been the result. Numbness has diminished, sores have healed up, swellings have disappeared, and patients who could only lie in helpless uselessness in a corner waiting for death, are now "so delighted at being able to walk about, that he is never at rest, always cleaning the compound, pulling weeds, trimming the walks, and in many ways shows his usefulness."

"The change the tubercles undergo in the process of reduction is worthy of notice. After the lapse of some time the tubercle seems to become more movable and loose at the base, and it is felt to be softer there than at the apex; this softening process gradually approaches the surface, and at last a watery bleb forms, and this bleb soon bursts, and allows a thin serous clear fluid to escape, and a marked diminution is then observed as regards the size of the tubercle as compared with its former dimensions. This may take place two or three times, until the tubercle is quite reduced. I found it expedited matters very much to puncture these watery vesicles with the point of a lancet; and it allowed the fluid to escape without pain or inconvenience to the patient, and did not interfere with the rubbing process. I have seen a tubercle on helix of ear entirely subside after one formation of this vesicle. The gurjun ointment, though thoroughly rubbed on the surface of the body for four hours every day, produces no vesications directly from its action, and causes no pain whatever. It seems to be through its constitutional effects that the tubercles soften from within outwards. I have rubbed it over my own arm, and it did not cause the slightest pain or redness, though allowed to remain on all night. The emulsion, as I have already explained, is not disagreeable to the palate, and at first it had no well-marked influence upon the digestive system; but when the dose was increased to one drachm twice a day, it improved the appetite, and at the same time acted as a mild laxative. It also had a distinct diuretic effect; and the larger dose (four drachms) twice a day caused several large healthy motions—in fact, acted as a powerful diuretic and evacuant."

"No change whatever has been made even in the most minute particular in regard to the diet of the lepers from what they have been getting for years past, and they get their fish four times a week as usual. I always thought, and still consider, the men under-fed; still I made no change, in order to avoid complications and to test the gurjun-oil on its merits. It is not the lime that has the beneficial effect, because the improvement commenced before the lime was given at all, and has continued in cases where only the oil and lime-water mixture was given. Any medicine that can ameliorate the condition of the lepers throughout the various countries where the disease exists is not less likely to be brought into common use because it is cheap, easily prepared and applied, and the supply inexhaustible, and many poor lepers may be able to use these preparations who might find it difficult to obtain a liberal diet, fresh meat, milk, wine, and foot-baths of hot cocoanut-oil, with the skilled attendant and his thermometer to look after the temperature. None of the above are required in this plan of treatment. I have had the lepers washed daily with water and dry earth, using the dry earth not only because it is cheaper than bran or soap, but because it is a better detergent than either. The gurjun-ointment keeps well, especially when not too freely exposed in bulk to the atmosphere, because the Co_2 in the air is apt to convert a small portion of the $Ca\,H_2\,O_2$ into $Ca\,Co_3 \times H_2\,O$. I keep it here in a large jar with a wooden lid."

That the labour of love which has proved so successful in the cases of the poor lepers has not been without its self-denial and hardships, is seen from the following paragraph, with which we close:—

"This inquiry has been conducted under various difficulties, not the least of which is the geographical distribution of the various stations of this settlement. My residence is on Ross Island; the lepers are located at Haddo; every visit I have paid the lepers has involved a double trip of 2¾ miles by sea in an open boat, not to mention a steep hill to climb at both ends of the sea voyage. I have gone to Haddo (most of the time during the south-west monsoon) generally three times a week, sometimes oftener, while under ordinary circumstances I would only have inspected that station once a month. All this had to be done without neglecting my duties on Ross, where I had to attend to about 250 sick in hospital, besides visiting regularly all the other stations."

The late Dr Livingstone's Humerus.—Through the forethought and kindness of Sir William Fergusson, a carefully-executed plaster cast of the fractured left humerus of the late Dr Livingstone, by which the great traveller's body was identified, will be placed in each of the following museums:—The Royal College of Surgeons, England; the Royal College of Surgeons, Edinburgh; and King's College, London. The fracture, which our readers will remember was caused many years ago by the bite of a lion, was oblique, and situated at the point of insertion of the deltoid muscle. The upper and lower fragments have slid over each other, the upper portion being, as might be expected, drawn to the outer side. A false joint existed between the two portions of the humerus; and lying between the fragments, in front of the fracture, and enclosed in a false cyst, was a small detached portion of bone. The shaft of the humerus was remarkably attenuated, especially in the upper portion. The lower portion of the shaft is rotated slightly outwards. The extreme length of the bone is fourteen inches, or exactly one inch shorter than the right humerus.—*Lancet*, 20th June.

Physiological Action of the Chinoline and Pyridine Series of Bases.—At the ordinary meeting of the Royal Society, held on Thursday, 18th June, at Burlington House, London, a paper on this subject, by John G. M'Kendrick and James Dewar, was presented by Professor Burdon-Sanderson, and read by the Secretary. The substances examined were Chinoline, Lepidine, Dispoline, and Tetrahiroline, as representatives of the Chinolines; Pyridine, Picoline, Lutidine, Collidine, and Parvoline, as representing the Pyridine series; and, finally, condensed bases of the Pyridine series, termed Di-pyridine, and Parapicoline, resembling in percentage chemical composition such natural alkaloids as Conia and Nicotine. The results, which are of great interest physiologically, we hope to give, after an abstract of the paper has appeared in the Proceedings of the Royal Society.

Death of Dr Charlton.—Dr Edward Charlton, who died at the comparatively early age of 60, on the 14th of May, was one of the best known and most respected physicians of the North of England. Learned, yet not pedantic, a well-born and well-bred gentleman, as well as a laborious and accomplished physician, full of kindness and geniality, he was marked out as the fitting head of the profession in his own town and neighbourhood. He was a graduate of Edinburgh University, and, like many other men distinguished in after years, he won his spurs in youth, when he was elected one of the Presidents of the Royal Medical Society. He wrote papers on scientific and antiquarian as well as medical subjects, and was a man of much culture and refinement.

Centenarian.—It is rarely a doctor reaches such a good old age, so we quote the following for Mr Thoms, from the *Philadelphia Reporter* for 28th February 1874:—

"Dr Francis Hoy.—In January, Dr F. Hoy died at Columbus, Ohio, one hundred and three years, one month, and twenty-nine days old. Dr Hoy was born at Wurzburg, Bavaria, 8th December 1770. He chose the medical profession, and after practice in

Bavaria extensively, over a period of thirty-eight years, he emigrated to this country in 1834, when sixty-three years old. He continued the practice of medicine in some of the Eastern States until 1861, when he came to Columbus, where he has since resided. Mr Hoy celebrated his centenary anniversary in 1871. On that occasion Dr Hoy was as lively as the youngest person present. This state of health continued until a week before death, when he took cold, which settled in his throat; and notwithstanding prompt medical treatment was accorded him, he continued to grow worse, and was prostrated on his bed, from which he never again arose."

PUBLICATIONS RECEIVED.

Edward B. Aveling,—Botanical Tables, for the Use of Students. London, 1874.

Robert H. Bakewell, M.D.,—Growth and Reproduction of the Red Corpuscles of the Blood. Otago, 1874.

Amariah Brigham, M.D.,—Influence of Mental Cultivation upon Health. London, 1874.

James L. Bryden, M.D.,—Vital Statistics of the Bengal Presidency, 3 vols. Calcutta, 1874.

L. Duncan Bulkeley, M.D.,—Herpes Gestationis. New York, 1874.

Josephine E. Butler,—Some Thoughts on the Present Crusade against the State Regulation of Vice. Liverpool, 1874.

Thomas Buzzard, M.D.,—Clinical Aspects of Syphilitic Nervous Affections. London, 1874.

J. F. Clarke, M.R.C.S.,—Autobiographical Recollections of the Medical Profession. London, 1874.

Charles Clay, M.D.,—Complete Handbook of Obstetric Surgery. London, 1874.

Josiah P. Cooke,—The New Chemistry. London, 1874.

Dr Jos. Englisch,—Ueber Zufälle nach Operationen an den Harn-und Geschlechtsorganen. Vienna, 1873.

R. Eglesfeld Griffith, M.D.,—Universal Formulary. Philadelphia, 1874.

Prof. Alex. Harvey, and A. D. Davidson, M.D.,—Syllabus of Materia Medica. London, 1874.

Dr Haussmann,—Die Parasiten der Brustdrüse. Berlin, 1874.

Hebra on Diseases of the Skin, vol. iii. London, 1874.

Charles J. Hempel, M.D.,—The Science of Homœopathy. New York, 1874.

James Hinton,—The Question of Aural Surgery. London, 1874.

Dr Eduard Hitzig,—Untersuchungen über das Gehirn. Berlin, 1874.

H. Aubrey Husband, M.B.,—The Student's Handbook of Forensic Medicine. Edinburgh, 1874.

J. Wickham Legg, M.D.,—The Liver in Jaundice. London, 1874.

Edward Lund, F.R.C.S.,—Five Years' Surgical Work in the Manchester Royal Infirmary. Manchester, 1874.

Dr Albert Mooren,—Ophthalmologische Mittheilungen aus dem Jahre 1873. Berlin, 1874.

Edward Parrish, M.D.,—Treatise on Pharmacy. Philadelphia, 1874.

J. Bell Pettigrew, M.D.,—Physiology of the Circulation. London, 1874.

Henry L. Saxby, M.D.,—The Birds of Shetland. Edinburgh, 1874.

P. Schivardi e G. Pini,—Annuario delle Scienze Mediche. Milan, 1874.

Edwin Sercombe,—Inaugural Address at Opening of Dental Hospital of London. London, 1874.

William Paul Swain, F.R.C.S.,—Surgical Emergencies. London, 1874.

John C. Thorowgood, M.D.,—The Student's Guide to Materia Medica. London, 1874.

J. M. Toner, M.D.,—Dictionary of Elevations and Climatic Register of the United States. New York, 1874.

Transactions of the Epidemiological Society of London, sessions 1869 to 1873. London, 1874.

Edward John Waring, M.D.—Remarks on the Uses of some of the Bazaar Medicines and Common Medicinal Plants of India. London, 1874.

W. Whalley, M.R.C.S.E.,—A Popular Description of the Human Eye. London, 1874.

J. J. Woodward,—On the Structure of Cancerous Tumours. Washington, 1873.

Part First.

ORIGINAL COMMUNICATIONS.

Article I.—*Extracts from Harveian Address of* 1874. By R. Omond, M.D., Honorary Secretary of Royal College of Surgeons, Edinburgh.

The institution of the Harveian Society was inseparably connected with that of the Æsculapian. The leading practitioners of Edinburgh were members of both, and each Society regarded as its founder Dr Andrew Duncan, Professor of the Institutes of Medicine in Edinburgh University.

The Æsculapian is the older, dating from 1773, and during the next three years its members held conventions for supper at nearly the same hour at which doctors now meet for dinner.

In 1776 the Æsculapians resolved to offer a prize for the best essay on some professional subject, to be competed for by medical students, and from this praiseworthy effort arose the Harveian Society. The prize was to be in value not less than five guineas, and, at that date, the offer was generous, and viewed professionally, it was a decided step in advance.

To give every year, however, a reward of this value was found to be a somewhat heavy tax on a small number of members—about a dozen only; and the ready expedient was devised of forming a society on a wider basis. The Æsculapian consisted exclusively of Fellows of the Colleges of Physicians and Surgeons, while the new Society contemplated, in addition to these, to admit practitioners from Mid-Lothian and adjoining counties, and also naval and military medical officers.

The Society thus formed held its first meeting in 1782. The original members laid their plans with deliberation. The birthday of Harvey in 1578, 1st April old style, 12th April new style, was selected for the annual meeting, and at this early date the arrangements for business and for social meetings bear on them a stamp of durability.

The Society had two names—the Harveian and the Circulation Club, and for many years the latter was the favourite designation.

The following twenty-three names, alphabetically arranged, formed the roll of 1782:—Dr William Anderson, Mr Benjamin Bell, Dr William Chalmers, Dr Forest Dewar, Dr Andrew Duncan, Mr James Gibson, Mr William Grieve, Mr Alexander Hamilton, Dr James Hamilton, Mr James Hay, Mr Thomas Hay, Dr William Inglis, Dr Robert Langland, Mr Colin Lauder, Dr Alexander Monro, Dr Daniel Rutherford, Dr Nathan Spens, Dr Robert Walker, Dr Andrew Wardrop, Dr Charles Webster, Mr Alexander Wood, Dr Andrew Wood, and Mr Thomas Wood.

Dr Duncan was the first President, and was shortly after elected Secretary for Life, and the number of members was soon increased to about thirty, including the well-known names of Mr John Bell, Dr Cullen, Dr Farquharson, Dr Andrew Inglis, Dr M'Clure, Mr John Rae, and Dr Home.

The friendly feeling then existing between the Harveians and Æsculapians is proved by the fact that there is only one register of the prizes advertised and bestowed. The Harveian dates from 1782, but for five years previously the Æsculapian competitions are only to be found in Harveian records, showing how completely the two Societies had fraternized.

The prize essay of 1777 was, On Distinguishing Pus from Mucus. Next year the subject was the Cause of the Red Colour of the Blood. In 1779 and two following years, the prize subjects were, On the Nature of Coagulable Lymph, On the Serum of the Blood, and On the Composition of Milk; and these five annual prizes were all gained by English or Continental students. The first prize-winning Scotsman is recorded in 1783—Mr Ralph Irvine from Langholm—his essay being on the Properties of Peruvian Bark. Next year Mr Irvine gained a second time for a Dissertation on Ipecacuan and its Varieties. He had been preceded by English students, and he was followed by three Americans: one from Virginia, a second from Pennsylvania, and the third from Brazil.

For the next few years the Harveian festivals were numerous and well attended. Dinner-hour was three o'clock, and the place of meeting Sommer's Inn, West Register Street. Visitors were introduced by the office-bearers, the laws restricting the number to four, and after a time to six.

Dinner is mentioned as consisting of three courses, and a bottle of port was allowed to each one present, with permission to change it, by private arrangement, for claret. The annual assessment was six shillings, and the Society's finances required to be supplemented in some way; this was effected by the popular plan of laying wagers.

The Harveians eagerly entered on the voluntary assessment of betting on any subject, such as a projected bill in Parliament, or on filling up a vacant place in the University or Court of Session. To bring to a meeting contending specimens of rum for punchmaking was a favourite wager, and the expectation of marriage in the case of bachelors furnished abundant supplies of magnums of port and claret. Regarding such bets, the winners are seldom recorded, but there was one unfailing result—the circulation after dinner was promoted.

While the Harveians were thus progressing usefully as well as socially, a sudden reverse took place. The Edinburgh medical men seem to have been all at once impressed with the necessity of taking more care of their own health, and the Harveians were included in the prevailing epidemic. Too much attention had been bestowed, they said, on the culture of the mind, and their bodily organs had been unwisely neglected.

To develop and enlarge the muscles became the popular cry, and the year 1786 witnessed the formation in Edinburgh of a new institution called the Gymnastic, which pushed aside for a time the Harveian as well as the Æsculapian.

It is frequently stated, but incorrectly, that the Gymnastic was the parent of the other Societies; but the fact is, the Harveian had been four years in existence, and the Æsculapian thirteen, before the Gymnastic commenced.

Its popularity at first was extreme. Many of the names already mentioned joined it, bringing friends with them, and the members were soon thirty in number.

To add a new beat to the pulse of the heart was the Society's primary law, and the Ludi Apollinares, golfing, bowling, and swimming, were declared to be the chosen exercises of the Gymnastics. There was much of boastful pretension in the new Society. The two older ones had adopted the humble motto, "Floreat res medica;" but the Gymnastic preferred, "Esto perpetua;" and in selecting Leith Golf-house as the place for festivals, there is something ludicrous in the words added, "In this house the annual meeting is to be held, in sæcula sæculorum;" and the comment on this law is, that about a quarter of a century formed the whole successful period of the Society's career.

In each branch of games an annual competition took place on a fixed day, generally during the second week of August, and the following are the results during a period of twenty years, from 1786 to 1806, naming each victor who gained a prize, generally a medal, with name, date, and subject of competition engraved on it:—

1. In the branch of golfing there were seventeen annual competitions, when the following four members gained once:—Mr Thomas Wood, Mr Inglis, Mr Raeburn, and Dr Hope.

The following three members gained twice:—Dr Wardrop, Dr Hay, and Dr Hamilton.

Mr Alexander Wood gained three times, and Dr Duncan was victor four times.

2. In the branch of bowling there were fifteen annual competitions. The following nine members gained once:—Mr Ben-

jamin Bell, Dr Hay, Mr Bennet, Dr Hamilton, Dr Andrew Inglis, Dr George Wood, Dr Wardrop, Dr Hope, and Dr Farquharson.

And three members gained twice, namely, Mr Andrew Wood, Dr Duncan, and Dr Dickson.

3. In swimming there were only nine annual competitions during the same period.

The following five members gained once:—Mr Balfour, Dr Cheyne, Dr James Home, Dr Dickson, and Dr Farquaharson.

While Dr Duncan gained four times.

It will be observed how often the names of Harveians occur as the Gymnastic victors. Dr Duncan was more frequently successful in golfing and swimming than any other competitor, and he alone took medals in all the branches of games.

These competitions were concluded before dinner, which was ordered at four o'clock, then considered a late hour. According to law, the bill was called for at six; but according to custom, the sederunt must have been frequently prolonged. The close of one meeting is reported as follows:—

> "The Club at eight breaks up in haste,
> Dum seria mixta joco;
> The hall resounds, quam dulce est,
> Desipere in loco."

At this time much cordiality existed between the Harveians and the Gymnastics, though the latter continued to be more in favour, and the Harveians found a difficulty in keeping up their number; and attendance, even at festivals, became scanty. But gradually, as the older Gymnastics became infirm, the Ludi Apollinares were more and more neglected; one year passed, and sometimes two or three, without the annual contest, and members were officially reminded that they overlooked the object for which the Society existed.

Dr Duncan's assiduity was unabated. He was generally supported by Dr Hamilton, Mr Alexander Wood, Dr Rutherford, and a few others. Dr Duncan was oftener in Leith Links than any other member. On one occasion a special prize was voted to him for golfing, the game having been played *solus c. solo;* and a few years afterwards the following are the terms in which three prizes were voted:—

1. To Dr Hamilton, victor in golfing, because, although absent, he had intended to have golfed, and none came to oppose.

2. To Dr Barclay, victor in bowling, for his decided superiority.

3. To Dr Cheyne, victor in swimming, because, had he gone into the sea, he would have beat Dr Duncan, who did not swim that day.

There is little to add regarding Gymnastics. The original members were not followed by active successors, and the resigna-

tion or death of the older ones became irreparable. Although the Society continued to meet year after year, it was chiefly as a small dining-club at Leith; and, after the resignation of Dr Duncan, only a short time before his death in 1828, the Gymnastic Society rapidly declined, and its property and records, consisting only of cups and silver medals, were handed over to the Æsculapians, after an existence of about forty-five years. There is no exact register of its members, but altogether they do not seem to have exceeded fifty.

Reverting to the Harveians, the first notice of an address at the annual festival takes place in 1795. Mr John Bell, the celebrated surgeon, had been at this time appointed assistant secretary to Dr Duncan, and the meeting of '95 recommended Mr Bell to prepare a short account of some illustrious professional man to be read at the festival of '96. And, about four years afterwards, the rule became imperative, that the præses should either give or provide an address. The place of croupier was also now introduced, on the footing of giving him a year to prepare for the chair.

At this time there is no record of prize essays for several years; but a special committee is named, consisting of Professor Hope, Dr Brown, and Dr Duncan, to prepare questions to be proposed as Harveian prizes, for the first five years of the nineteenth century. It may be presumed that Dr Hope, who was præses in 1800, selected the first subject, regarding different kinds of gas, which failed to attract the students. At all events, no essay was lodged in competition, although advertisements were repeated for two years.

In 1803, the Society was declared to be of age, having existed for twenty-one years. It was resolved to have the innovation of a clergyman present at each festival, and the novelty of issuing Harveian diplomas was adopted. The first recipient was Mr Alexander Wood, styled in the minutes a promising youth, now in the 77th year of his age. He was president at the festival of 1803, while Mr Andrew Wood was croupier.

The first four lines of the diploma are—

" Evectus nunc, sit Sandy Wood,
Honestus vir, both wise and good,
Doctor of mirth, nos hunc creamus,
And to you all, nunc commendamus."

In bestowing this diploma, with all the liberties, privileges, and powers attached to that dignity, a few lines were added, supposed to proceed from no lower authority than Harvey himself, who, it will be remembered, died in 1657.

" Harvey, if here, would say, O honour mirth,
From which true circulation takes its birth!
It gives the aid of mind to rouse the heart,
And send the living stream to every part."

And the last four lines are—

"Mirth proves there's more in man than sluggish clay;
Long may it cheer your hearts on Harvey's day!
I speak of mirth that's innocent and good;
Such mirth be ever thine, dear Sandy Wood."

The author of these lines was understood to be Dr Duncan.

The plan of betting still continued, but not so frequently. Instead of six or eight wagers at a meeting there was sometimes only one, as when Dr Cullen is found engaged in a bet that Mr Bennet will not hit a piece of paper 12 inches square, at 10 yards distance, in one of three shots, with a pistol loaded with single ball. Games of golf proved on the whole the most frequently repeated wagers; but from the fact that the Harveian Treasurer at this time requested the dinner payments to be raised, it may be presumed that the betting assessments were less productive than before.

For a succession of years one or more of the following clergymen received invitations to attend the annual festivals—Rev. Dr Moodie, Rev. Dr Dickson, Professor David Ritchie, and the Rev. Dr James Grant.

The first of these was in high favour with the Harveians, and was generally addressed as Pontifex Maximus. Dr Moodie was one of the ministers of St Andrew's collegiate charge, and also Professor of Oriental Languages in the University of Edinburgh. At the last annual meeting he attended, the Harveian diploma was conferred on him with much cordiality.

It begins as follows—

"To all good fellows, be it notum
That William Moodie, virum Scotum,
Has proved his power in merriment,
Ut scripta multa nunc nos docent."

And the learned Professor of Languages acknowledged the compliment in the following lines, without help of Latin, Greek, or Hebrew—

"With Æsculapians I did sup,
And with Harveians kept it up;
With dear Gymnastics oft was happy;
Our friends were kind, our liquor nappy,
And he, who noo the truth maun tell,
Ne'er saw waur 'mang them than himsel'."

Diplomas were only conferred on distinguished Harveians. Dr Duncan, of course, received one, and this was in addition to his being called Sir Andrew, Knight of the Beggar's Benison—an historical tradition connected with the East Neuk of Fife, from which locality the ancestors of Dr Duncan came. Dr Barclay, teacher of Anatomy, in 1815, took an active part in preparing the diploma for the Society's founder, and a few years after a similar compliment was paid to himself.

A special honour was paid to the memory of Monro primus, who died in 1767. The Harveians of 1812 liberally provided a marble bust of Monro, when eighty-eight members contributed. This bust was presented to Edinburgh University, and placed in the Library.

In 1822, the rule regarding visitors was extended. Instead of restricting admissions to the officials, every Harveian received permission on certain conditions to bring a friend, thus making attendance at festivals more varied; and when a visitor joined heartily in the proceedings, he was apt to be assumed by acclamation as an extraordinary member. In this way Mr Raeburn, afterwards Sir Henry Raeburn, was admitted, and Sir Alexander Boswell. These were chosen on the footing of being Harveian poet-laureates, and so also at a later date was Professor John Wilson, of the Moral Philosophy Chair. Many verses from each of these have a place in the Society's records.

In its history the Harveian has had periods of alternate success and decline, and in no department is this more remarkable than in its prize competitions. Fifty years ago the Society was known to the profession in every part of the kingdom by the success of its prize-giving arrangements.

In 1824, for instance, an excellent treatise on Urinary Deposits gained the prize for a well-known student, Mr Lubbock from Norwich. Next year Mr James Dallas from Inverness was the victor, the subject being on Gastric Secretions. In 1828, the competition was about the Effects of Lettuce Opium on Domestic Animals, and was gained by Mr Handyside, now the successful teacher of Anatomy. In 1830, the Stethoscope was the prize subject, and the gainer was Dr Robert Spittal. And once more, in 1833, the properties of Strychnia being under investigation, Dr James Marr was victor.

This was the golden period of Harveian competition, and when the Society received several essays of high merit a second prize was occasionally voted. A change followed, and in explaining the cause of decline, one must recall how few rewards were held out at that time to medical students. Those who attended classes from forty to fifty years ago, will remember that while university students in the Edinburgh literary classes had a fair field for competition regarding medals or books, there was almost none in medical classes. The regular curriculum for graduation might have been attended, and, with the single exception of the summer course of botany, no chance was given to compete for any prize.

In these circumstances the Harveian Medal was naturally much coveted. But soon the medical curriculum was extended, class after class being added, and competition among teachers, both in the University and outside, led to the introduction of numerous class prizes, which students of course tried to gain; while the more industrious among them complained of having no spare time for investigations such as the Harveian Society expected in competing for its medal.

An attempt was made to meet difficulties by increasing the value of the prizes offered, but still the competitions languished, and after bestowing a prize or two, when only one essay was lodged, the Society in 1864 withdrew from prize-offering.

One of the remarkable things connected with the Harveian and other societies has been the longevity of the secretaries. In the Gymnastic, Dr James Hamilton, with the three-cornered hat, acted as secretary during the whole period of its existence, except the last year or two; and in the Æsculapian, Professor Duncan was secretary for fifty-four years, from 1773 to 1827, and was followed by Dr Huie, whose successor still continues to act.

As the Harveian early adopted the plan of having two secretaries, the names are more numerous. In the long period of Dr Duncan's service, about forty-six years, he was assisted by Dr Webster, Mr John Bell, and Dr Bryce. Dr Duncan's successor was Dr Huie, who had first Dr Moncreiff, and then afterwards Dr Handyside, associated with him. Since their resignation in 1849, no more efficient secretary has served the Society than the late Dr Seller, and no Harveian was ever more devoted than he to the Society's interest. He eagerly went into a proposal to prepare for publication a volume of Harveian addresses, to consist of biographical notices of deceased medical worthies. The late Sir James Simpson was equally ardent on this object, and both undertook to write several memoirs, which were intended to be short and popular, and to include men in the eighteenth century, whose names are now seldom mentioned. Both died without furnishing any such notices.

Biography has been a favourite subject for addresses on Harvey's Day. An account of Monro primus, read by Dr Duncan, is the first recorded. In 1829, a tribute of respect to the memory of Dr Duncan was read by Dr Huie. When Sir Robert Christison, now the senior Harveian, presided in 1837, he read a memoir of Professor Edward Turner of London University. When Dr Simson was president in 1841, he gave the biography of Dr Duncan, jun., a learned physician, though sooner forgotten by Harveians than his father; and without attempting to enumerate all, the following seven may be mentioned, being those addressed to meetings during the last twenty years.

1. Biography of Dr Abercrombie, by Professor Douglas Maclagan.
2. On Dr Alison, as compared to Harvey, by Professor Miller.
3. On Mr Hey of Leeds, by Mr Benjamin Bell.
4. On the Early Years of Dr Alison, by Dr Halliday Douglas.
5. On Sir George Ballingall, by Dr Dunsmure.
6. On Mr John Bell, by Professor Spence.
7. On Professor Syme, by Dr Robert Paterson.

ARTICLE II.—*The Relation of the Cranial Contents to the Pressure of the Atmosphere.* By JAMES CAPPIE, M.D.

(*Read before the Medico-Chirurgical Society of Edinburgh, 4th February.*)

A GENERAL knowledge of the facts concerning the pressure of the atmosphere on the surface of the body is sufficiently familiar. Its enormous aggregate amount, and the reason why such a weight does not injure the most delicate of organic structures, are well known. Bearing with a ratio of nearly fifteen pounds to every square inch of surface, an equal and contrary pressure of the fluids within serves to preserve an equilibrium so nice that no sensible result need be noticed from its presence. This, of course, is simply analogous to what is observed in the world of physics. When the air is still, its weight does not seem to interfere with the mobility of the magnetic needle, nor will it break the finest film of glass. The pressure of fluids being exerted in all directions, the opposing pressure below is equal to that above or at the sides. But the presence of a great energy is at once shown on the occurrence of any change in the balance of resistance. Thus, in nature, the destructive effects of the hurricane bear witness to its potency; and, in art, the workman can contrive by its aid to suck up water to the height of thirty feet above its previous level; and the surgeon can produce the once familiar effects of cupping, or the more recent results of aspiration.

It cannot be without interest to ascertain whether that force is made to subserve the attainment of required ends in the animal economy. In the construction of the body there is not only the adaptation of one structure or function to other structures and functions, but there is also an adaptation of structures and organs to the outward physical forces of nature. Thus, the mechanism of the eye enables us to recognise the subtle undulations of the ether as light, and through that of the ear the undulations of air are converted into sound. It was therefore to be expected that some mechanism would be found in animal bodies to make the weight of the atmosphere useful, and I shall allude to some of the contrivances for this purpose, before speaking of the special relation which is the subject of the present paper.

"There is an effect of the atmospheric pressure on the living body which is rarely thought of, although of much importance, viz., its keeping all the parts about the joints firmly together by an action similar to that of the Magdeburg hemispheres. The broad surfaces of bone forming the knee-joint, for instance, even if not held together by ligaments, could not be separated by a force of less than about a hundred pounds while the capsule surrounding the joint remained air-tight. In the loose joint of the shoulder this support is of greater consequence. When the shoulder or other joint is dislocated, there is no empty space left, as might be supposed, but the soft parts from around are pressed in to fill up the natural place of the bone. When a thigh-bone is dislocated, the deep socket called the acetabulum instantly becomes like a cupping-glass, and is filled partly with fluid and partly with the soft solids. In all joints it is the atmospheric pressure which keeps the bones in such steady contact that they work smoothly and without noise."[1]

A function in which the atmospheric pressure has long been recognised as taking an important part is that of respiration. "Distension of the pulmonary cavities is entirely accomplished by the action of the muscles external to the thorax, or partly forming its parietes. The lung completely fills the cavity of the pleura, in the healthy state at least; so that when this is enlarged, a vacuum would be produced, if it were not occupied by a corresponding enlargement of the lung; and to effect this the air rushes down the trachea, and thence passes into the entire substance of the lung, which it fills out in every direction. The complete dependence of the expansion of the lungs upon the enlargement of the cavity of the chest is well shown by the effect of admission of air into the pleural cavity. When an aperture is made on either side, so that the air rushes in at each inspiratory movement, the expansion of the lung on that side is diminished or entirely prevented, in proportion to the size of the aperture. If the air can enter through it more readily than through the trachea, an entire collapse of the lung takes place; and by making such an aperture in each side, complete asphyxia is produced."[2]

In assisting the action of the heart, the pressure of the atmosphere takes an important part. "The heart," says Dr Pettigrew, "has the power of forcibly expanding itself, as it has of forcibly closing itself. It can therefore, in virtue of its rhythmic movements, alternately suck in and eject blood—the auricles attracting it while the ventricles are repelling it, and *vice versa*."[3] The pressure bearing on the surface of the body thus becomes an essential auxiliary to the whole circulation. It is evident that no dilatation of any of the heart's chambers can take place without the pressure on the inner surface of their walls being sustained. That is to say, the muscular force would not succeed in forming an absolute vacuum. The filling of the cavity must be simultaneous with its dilatation, and in securing the former part of the process, the weight of the air becomes a necessary agent.

In the abdomen, if its mode of operation is less obvious, the action of the atmospheric pressure is still very important. How it may make the walls of the cavity adjust themselves to the change of bulk which so frequently occurs in the contents of the intestinal canal is sufficiently obvious, but this is only a small part of the use it subserves here. It also affords positive support to the weighty abdominal viscera. As the liver and stomach (the latter perhaps loaded with food) lie at the upper part of the cavity, they would tend strongly to gravitate towards the pelvis, if only supported by their respective attachments. The support of the mobile intestines would go for very little if any communication existed with the external air above the liver. Many facts seem to prove, however, not only that there is no dragging of the attachments of the abdominal viscera, but that there is a decided tendency to upward suction in the cavity.[1] Here the pressure of the atmosphere, bearing on the pliable parietes, is likely to be the potential agent, and its energy will be kept in active play by the movements of respiration. These movements involve a constant change not only in the shape of the thorax, but also in that of the abdominal cavity. They do not necessarily affect the cubic capacity of the latter, for the bulk of its contents may for a period remain without alteration. If the cavity expands or relaxes in one direction, it must contract in another. During inspiration, which is a purely muscular act, the diaphragm descends and the upper part of the cavity flattens out. In expiration, the lung contracts from the elasticity of its own tissue, aided by the rebound of the ribs, and by a muscular effort in which the muscles of the abdomen take a share. The simple act of resilience in the lung, tending to form a vacuum in the pleural cavity, will, of course, produce a suction effort towards the diaphragm as well as towards the ribs. If any response is to be made from the former direction, the resilience will require as its complement the pressure of the air on the pliable wall of the abdomen. That pressure will urge the viscera in the direction of the receding diaphragm. The upward movement of the liver will also be assisted by the elastic rebound of the ribs which form the lower third of the thorax. Then, as the liver is comparatively a solid organ, and as it extends across the whole upper part of the cavity, it cannot move upwards without tending to form a vacuum beneath it. An adspiratory effort is thus produced, the effect of which may be communicated to any part of the cavity on which the atmosphere can bear, and such effort must accompany every act of expiration.[2] Thus, not only is efficient support afforded to the abdominal viscera, but, as Dr Duncan has pointed out, the accomplishment of other ends, such as the return of venous blood from the lower extremities, is at the same time promoted.

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[1] Arnott's Elements of Physics, p. 327.

[2] Carpenter's Physiology.

[3] Edinburgh Medical Journal, Feb. 1873.

Coming now to the cavity in which the most important organ of the body is lodged, we find that the contents of the cranium have a relation to the pressure of the atmosphere very different from what we have found in the other cavities of the body. Whatever be the changes that go on in its interior, direct pressure from without cannot affect them. The compact bony wall cannot expand and contract like the walls of the thorax, or like those of the heart or abdomen. Yet here, too, we shall find a mechanism specially fitted to cause the outward pressure to subserve the attainment of important physiological ends.

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[1] See Dr Matthews Duncan's Essay on "The Retentive Power of the Abdomen."—*Researches in Obstetrics.*

[2] It should be mentioned, however, that Dr Duncan supposes that "greater adspiratory power in the abdomen" exists with the "*in*spiratory effort." Op. cit., p. 429.

We do not require to consider whether the cranium could resist the weight of the atmosphere if a complete vacuum were created within it; nor need we even discuss whether an infinitesimal amount of change may not be accomplished by moderate physical means. The relief afforded in certain forms of headache by tying a handkerchief tightly round the head, would seem to show that internal support may be modified by outward pressure. Still, it will be admitted that any such change must be extremely small, and that even in the cranium of an infant we have an amount of resistance of which we have no example in any other cavity of the body except the spine.

I need hardly say, however, that pressure bearing on the general surface of the body will be readily directed to the interior of the skull through the bloodvessels which enter and make their exit from its cavity. Any active impulse to which liquids are subjected is communicated equally in all directions, and therefore, by means of the blood, the whole interior of the skull, and the whole contents of the cavity, are brought completely and equally under the potential energy of the atmospheric pressure.

If such be the case, then we may assume, without any argument, that here, as in other parts of the body, an equilibrium must at all times be preserved between the pressure on the surface and that within the skull. In any other case the circulation of blood through it would be impossible. The conditions of this equilibrium being preserved involve, 1st, absolute fulness of the cranial cavity; and, 2d, this peculiarity—that for any quantity of blood made to enter the cavity, an exactly equal quantity should at the same moment be discharged from the venous sinuses.

Our further object in this paper will be to illustrate these points in the first place, and then to show how certain forces are at work whose tendency it is to disturb the equilibrium of the internal circulation, and therefore of the internal pressure, and to point out the modes in which an equilibrium may be preserved or rectified.

I may remind you that the discussion of some of these questions here is not new. It was before this Society, and indeed in the first session of its existence, that Dr Kellie of Leith read the celebrated essay which has since given rise to so much discussion. The full title of Dr Kellie's paper was,—"An Account of the Appearances observed in the Dissection of two of three Individuals, presumed to have perished in the Storm of the 3d, and whose Bodies were discovered in the Vicinity of Leith on the Morning of the 4th Nov. 1821; with some Reflections on the Pathology of the Brain."[1] It was read in two parts,—the first on 6th Feb., and the second on 20th March, 1822. To give an adequate analysis of this essay, to point out its immediate effect on cerebral pathology, and then to trace the origin of misconceptions as to the views expressed in it, and the consequent misrepresentation of these which has been persistently indulged in during the last thirty years, would require a whole evening to itself. Had it earlier been thought of, such a theme would have afforded no unworthy subject for discussion in connexion with the jubilee of this Society,[2] which happened two years ago; but at present I shall attempt nothing more than a short analysis of the paper itself.

The general impression among recent writers seems to be, that Dr Kellie believed, and that he performed his celebrated experiments to prove, that the amount of blood within the skull must continue invariable. Now it so happens that the very occasion for Dr Kellie investigating his subject was the circumstance that, in the post-mortem examination of two individuals who had died from the effects of cold, he found from three to four ounces of serous fluid in the ventricles and at the base of the brain; and his reflections on the probable production of this quantity of fluid within a few hours led him to the conclusion that an amount of blood equivalent in bulk to the serous fluid had been pressed out of the cerebral vessels. "When the cavity of the cranium," he says, "is actually encroached upon by the depression of its own walls, or by an effusion of fluid within its cavity, one of two things it is obvious must follow,—either the compression of its previous contents into less space, or the displacement and removal of an equivalent bulk of their contents." He then gives reasons why he thinks it "highly improbable that in the course of a few short hours from three to four ounces of brain could be wasted or removed by absorption," and continues: "It seems more probable that in most cases of intrusion on the brain, compensation may be made at the expense of the circulating fluid within the head; or that less blood is then admitted and circulated within the brain than before such encroachment on its capacity has been effected."[3]

It thus appears that, so far from thinking that the amount of blood within the skull must remain constantly uniform, the admission of its decrease as a probable fact was actually the starting-point of Dr Kellie's investigations!

But then comes another question:—Supposing there is no opportunity for effusion to take place,—supposing the other contents to continue unchanged, can the quantity of blood within the skull be lessened? The inference he makes is that such an event is improbable, and the following is his line of argument:—

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[1] Transactions of the Medico-Chirurgical Society of Edinburgh, vol. i.

[2] This was written before the delivery of Dr Handyside's elaborate valedictory address.

[3] Op. cit., pp. 98, 99.

"The circulation within the head is in truth of a very peculiar description. The brain itself, little compressible, is contained within a firm and unyielding case of bone, which it exactly fills, and by which it is defended from the weight and pressure of the atmosphere—a force constantly acting on every other part of the system—a force therefore which must be constantly operating to maintain the plenitude of the vascular system within the head.

"If these premises be true, it does not then appear very conceivable how any portion of the circulating fluid can ever be withdrawn from within the cranium without its place being simultaneously occupied by some equivalent; or how anything new or exuberant can be intruded without an equivalent displacement.

"One of my oldest physiological recollections, indeed, is of this doctrine having been inculcated by my illustrious preceptor in anatomy, the second Monro—a doctrine which he used to illustrate by exhibiting a hollow glass ball, filled with water, and desiring his pupils to remark that not a drop of fluid escaped when inverted with its aperture downwards."[1]

To test the correctness of this doctrine he undertook his experiments, and made an examination of the different pathological conditions that might, *a priori*, be expected to produce depletion on the one hand, or overfulness on the other.

His first query was:—"Is it then true and consistent with experience that we cannot lessen to any considerable extent the quantity of blood within the cranium by arteriotomy and venesection?" To determine this, he bled several animals to death in a variety of ways, and afterwards carefully examined the brains. For example, a sheep was killed in the ordinary way by the butcher, another was bled from the carotid artery alone, and a third from the jugular veins. In one case he tied both carotids, and four minutes afterwards opened the jugular veins; and in another he tied the jugular veins, and five minutes thereafter opened the right carotid. A dog was bled from both femoral arteries. Then, "to afford examples of brain not depleted by previous hæmorrhagy," he tied both carotids (including the pneumogastric nerves) in two dogs, and allowed them to die, and a third dog was poisoned with prussic acid. The general belief seems to be, that Dr Kellie thought he had proved that bleeding to death does not affect the amount of blood left in the vessels within the cranium. This, however, is a mistake. For example, in speaking of the last three cases, he says, "These comparative experiments afforded us the most satisfactory proofs that the other brains had really been depleted by bleeding, and the vessels drained of a very sensible proportion of the red blood usually contained in them."—P. 115. Still, the results on the whole came near to what he expected, and, with a guarded carefulness of expression which runs through the whole essay, he was satisfied that it had been "found nearly true that there are such obstacles as the hypothesis supposes to the free depletion of the vascular system within the head." In no case was the brain found at all exsanguined, and where there appeared to be a loss, it was probably caused by the proportion of the red corpuscles in the blood being reduced.

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[1] Op. cit., p. 102.

"The summary of these observations," he says, "in so far as they apply to our present subject of inquiry, may be thus stated,—that although we cannot by any means of general depletion entirely or nearly empty the vascular system of the brain as we can the vessels of the other parts of the body, it is yet possible, by profuse hæmorrhagies, to drain it of a sensible portion of its red blood; that the place of this spoliation seems to be supplied both by extra- and intrà-vascular serum, and that watery effusion within the head is a pretty constant concomitant or consequence of great sanguineous depletion."—P. 116.

Proceeding, then, with his argument, he remarks, that "if the obstacle to the free depletion of its vessels depends mainly on the cerebral system being defended from the weight and pressure of the atmosphere by the solid and unyielding cranium, it seemed probable that, by removing a portion of the skull, and allowing the atmosphere to gravitate upon the brain, we should succeed in producing a much greater depletion of its vessels by general bloodletting than can be otherwise effected."—P. 124.

To ascertain this point, he made other three experiments on dogs by removing a portion of the cranium with the trephine, and the animals were then bled to death. On afterwards examining the brains, the contrast in appearance to that of the former cases was very striking. Thus, in one of them "the vessels on its surface were reduced to mere hairs, the brain was remarkably pale, and the choroid plexus bloodless."

"Comparing, then, these with the observations made on animals bled to death by simple hæmorrhage, it appears that when the head is entire, the brain still contains a considerable quantity of blood,—when previously perforated, very little; the brain continues to fill the cranium in the one case, and subsides within it in the other."—P. 126.

Our author then remarks that "the same causes which maintain the plenitude of the cranium and oppose the depletion of the vessels of the brain may be presumed to present also natural and constant obstacles to the repletion of those vessels. To prove his case still further, therefore, he proceeds to an elaborate examination of some of those "occurrences and accidents in human life, and some diseases also incident to man, which bear on the question of repletion with all the force of direct experiment."—P. 127. He investigates the results on the brain circulation of death from suspension, suffocation, and drowning; the effects of stooping and other low positions of the head; the effects of some diseases of the heart and of its larger vessels; and, lastly, the effects of ligatures and tumours compressing the vessels of the neck so as to impede the free return of blood from the head. In concluding, he says, "I have thus passed in review the most important of those circumstances which, from the earliest era of medicine, have been presumed to have a powerful and undoubted tendency to force blood into, or to confine it within, the vessels of the brain, and so to produce dangerous morbid congestion of that viscus,—circumstances which accordingly have very generally been enumerated by systematic physicians as the principal exciting causes of comatose diseases; and although I am aware of many objections—though I know but too well the unlucky *pour* and *contre* which embarrass us in almost every subject of medical inquiry—I think a case has fairly been made out, proving that the agency of such causes has been greatly overrated; that nature has guarded with peculiar care the brain and its membranes against such accidents from repletion and depletion, as they must otherwise have been constantly exposed to; and that while the structure of this organ remains *healthy* and *unchanged* and its *vessels sound*, those causes are little capable of occasioning plethora, congestion, effusions, or comatose diseases."—P. 168.

I have thus fully referred to the observations of Dr Kellie, because it is on their assumed correctness that my future argument is founded. I have also been influenced by a wish to assist in reviving the scientific reputation of one of the eminent founders of this Society, by representing fairly, though inadequately, the doctrines he attempted to establish. Accepting his conclusions, therefore, as on the whole a safe starting-point for further inquiry, I proceed to notice with more detail the mechanism through which the atmospheric pressure affects the interior of the skull, and by which it may exert an influence on the physiology of the brain. I am not aware that any attempt has been made to differentiate further on this subject than was done by Abercrombie and Kellie. Indeed, the tendency has rather been to question the correctness of even such a general view as they took. As it would lead me far beyond the limits of a paper like the present to treat my subject in a controversial manner, I content myself with the single remark, that I know of no fact or argument that seriously affects the soundness of their conclusions. The exceptional cases of an infant, and of an adult who has lost part of the skull, will be afterwards alluded to, and shown to belong to that useful class of exceptions whose peculiarities "prove the rule."

In attempting, then, to determine with greater detail how the atmospheric pressure can affect the interior of the cranium, we require, in the first place, to distinguish between its mode of acting on the arterial and on the venous vessels. It will be found, I think, that this distinction is not unimportant. In the one case it acts in the direction of the current of the circulation, and in the other it is opposed to the current. In the one case, therefore, it assists the action of the heart, and in the other it opposes the return of blood from the head. Whatever influence the outward pressure may exert on the one system of vessels or on the other, it will be facilitated by the fact that "the terminations of the great veins or sinuses, or ends of the lateral sinuses, are not contiguous to the trunks of the corresponding arteries, as is observed in most other parts of the body, but pass through different holes in the cranium."[1]

At first sight it may be thought that the distinction I have made of a pressure on the arteries and on the veins is unnecessary, for, so far as the general circulation to and from the head is concerned, these forces must balance one another. The amount of pressure is the same in both sets of vessels, and thus, notwithstanding the potential weight of one atmosphere opposing the exit of blood from the venous sinuses, no interruption whatever takes place in its movement. The cavity being full, the internal pressure is as great as that on the surface, and the amount of blood making its exit depends simply and entirely on the amount that is made to enter the intracranial arteries. It will be convenient therefore to regard the atmospheric pressure as a constant quantity. It of course varies with the barometric pressure, but this variation will affect both systems alike. For example, its increase does not impede further the exit from the veins, because a forward pressure in the arterial vessels is increased to exactly the same extent. Thus, no disturbance in the encephalic circulation is occasioned by the rise and fall of the barometer.

To see how energy so potential as that of the atmospheric pressure can be converted into an energy that shall produce sensible results within the skull, we require to discover one or more factors whose varying value will qualify the result, and therefore have to be taken into account in determining what the ultimate product is to be.

Such a factor we may find in the greater or less activity of certain dynamic forces within the skull itself; and, as a co-factor, in the peculiar arrangement of the bloodvessels of the brain.

I allude, in the first place, to the molecular changes in the brain, and their effect on the capillary circulation; and, in the second place, to the fact that the circulation of the brain itself is almost entirely capillary, and that its principal bloodvessels, both arterial and venous, are supported on its external surface in the pia mater.

In surveying the relation which these conditions hold to one another, we shall, I think, find a field where a constant struggle may be supposed to go on between the forces propelling the blood onwards and the force tending to keep it back; where at one time the forward impulse is the more energetic, or produces greater results, and at another time the backward pressure prevails; and where momentous results are determined according as success is inclined to one side or the other.

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[1] Monro, "Observations on the Nervous System."

The molecular changes in the tissues constitute a force which exerts an influence on the circulation in all parts of the body. It is assisted by the ganglionic nerves regulating the minute arteries, but is not essentially dependent on these, and its activity and power of modifying the local circulation have no direct relation to the force of the heart's action. The blood itself does not flow passively, or only under the influence of the latter. In the capillaries it both acts and is acted on. It attracts to itself certain elements of the tissue, and the latter attracts certain elements from the blood, and a constant interchange goes on. The amount and rapidity of this interchange greatly modify the facility with which the blood passes through the capillaries. When more active, the circulation is brisker, and the pressure within the vessels is increased; when less active, the movement of the blood is more sluggish, and its pressure within the vessels is lessened. While it continues, the blood moves onwards although the *vis a tergo* has failed; if it ceases, the blood becomes stagnant although the action of the heart may continue strong.

The constant energy directed on the encephalic circulation by the molecular forces would tend to keep the vessels of the brain full, even though its mass were exposed to the unimpeded weight of the atmosphere on its surface; and, in fact, it keeps them full when such exposure is partial. It has been urged that serious disturbance should be expected on the removal of part of the skull, if it be true that in the natural state of the parts the brain is altogether withdrawn from such exposure. But, in making this objection, the existence and energy of the molecular forces have been overlooked, and the fact that these are as active in the brain of a child with an open fontanelle as in the adult with a close skull. Indeed, when part of the latter is removed by injury, it is the protrusion of the brain, or the preponderance of internal pressure, that is probably the more prominent phenomenon. Instead of collapse we have over-distension.

As is well known, however, vascular disturbances within the head are more readily produced in the child, and the direction of the disturbance can often be readily observed on the surface. When there is an actively congestive tendency within, the scalp at the open fontanelle is raised and has the appearance of a tense throbbing tumour. On the other hand, in atrophy of the brain, or where there has been a rapid drain on the fluids of the body, as in choleraic diarrhœa, the internal pressure being lessened, the surface sinks, and not unfrequently the shape of the fontanelle

is defined with great sharpness by the scalp falling in abruptly and tightly at the edge of the bones.

It is not necessary for me to say anything as to the nature of the molecular changes which constitute the nutrition, or are involved in the functional activity of the brain. I assume that even when the organ is quiescent they are subtle and unceasing, but that their amount, rapidity and energy are greatly increased when its function is in active exercise. This being the case, the tissue of the brain will have a more powerful attraction for the blood during the period of wakefulness than when the mental functions are suspended. The force with which that fluid bears against the internal surface of the arterial and capillary vessels, and, consequently, the fulness and tension of the whole organ, will then be also greater.

That there is such a tendency to increased fulness in the vessels of the brain during activity of function, is a matter of observation when the organ is exposed from injury of the skull. In the latter case, however, it may be urged that the appearance of increased fulness is simply the result of the larger space that has been gained. The problem to be solved is, how to permit increased vascularity in the brain without augmenting the blood within the skull. The difficulty may, to some extent, be removed by remembering the arrangement and size of the veins in the pia mater. These vessels are so numerous and so large and tortuous, that they seem specially fitted to become the receptacles of a varying amount of blood. It is possible, therefore, that an increase may take place in the brain-tissue by the proportion in the veins being lessened. We will be in a better condition, however, to judge whether such an occurrence is probable when our argument is further advanced.

Assuming, then, that in determining the intensity of the intracranial circulation, the molecular changes in the brain-tissue are the dominant factor, we have now to ascertain what relation the pressure of the atmosphere holds to their greater or less activity.

I have already hinted that, in supplying blood to the brain, the action of the heart may be assisted by the atmospheric pressure. When the body is in the erect posture, which it usually is when the brain is most active, and when it is of the greatest consequence that the supply be full and uninterrupted, the influence of gravitation is directly opposed to the free determination of blood to the head. Considering what a mass of this fluid is sent to the vessels within the skull, it is obvious that were the brain exposed to the unimpeded weight of the air on its surface, serious draining of its vessels would inevitably result on the head being raised; and to induce syncope, it would be sufficient to rise from a recumbent to the erect posture.

In some of the lower animals we see even greater necessity for some means being provided to counteract the effects of gravitation on the circulation of the brain. For example, the giraffe may at one moment be sipping water from a pool, and the next be nibbling leaves from a branch perhaps fifteen or eighteen feet above the ground! Here the construction of the skull serves not only to prevent the vessels of the brain from becoming too full when the head is low, but also from becoming emptied when the head is raised.

But that is not all. The forces acting on the capillaries, we assume, are not simply permissive,—they exert positive energy in attracting blood from one direction, and urging it onwards in another. If this be so, then, acting in a chamber which excludes all pressure from without, except what comes through the blood, these forces must exert an active suction power on the blood in the carotids. That is to say, they must tend to form a vacuum behind them; and to prevent this, the weight of the atmosphere, transmitted through the soft parts, will assist, not simply in sustaining, but also in actively directing the necessary amount of blood to the head, and thus an important, if not an essential, aid is afforded to the action of the heart.

It is, however, to the effect of the atmospheric pressure on the blood in the encephalic veins that I have especially to request attention. The tendency of that pressure here is to keep back the blood within the head. As resistance to the movement of a fluid reacts with energy on the fluid itself, and therefore on the channel through which it flows, that tendency will have effect on the internal surface of the veins through their whole extent, and thus, too, the brain itself is brought under the influence of a simple physical agency. Whatever be the impulse a fluid within a tube is subjected to, it will tend to dilate the vessel just as powerfully as to move the fluid onwards. Thus, the lateral pressure on the walls of the veins will be simply in proportion to the amount of propelling or opposing force that may be acting on the blood itself. In considering, therefore, how the backward pressure may be balanced or overcome, we have to take into account not only the force that moves the blood onwards, but also the support afforded to the walls of the veins by the solid brain-mass. The flow of blood will go on smoothly only so long as that support is stable and uniform.

We have seen that the dynamic forces within the brain-tissue vary greatly in energy, and that according to their energy the pressure of the blood within the capillaries is more or less strong. The circulation is fullest, and the whole organ is most expanded, when its function is in active exercise. A certain amount of pressure is then directed against the external surface of all the veins of the pia mater. Now, what will happen when that external support is lessened? This, of course, must occur, when the dynamic forces acting at the capillaries become weakened. If the blood is to circulate at all, a balance must be preserved between the pressure on the surface of the body and that within the skull; but at one point we find that the internal pressure is wanting in energy. The cranial wall cannot contract to keep up the necessary amount of support; the pia mater cannot leave the inner surface of the dura mater; the cerebro-spinal fluid cannot at once be augmented. The most likely result—or rather, I would say, the necessary result—will be that the lateral pressure within the veins will now bear with greater effect in dilating the vessels. The flow of blood will be retarded, and until a stable equilibrium is again reached, more blood will enter the veins than will be discharged from the sinuses. The brain is thus allowed to become less vascular, and yet the whole pressure within the skull remains nearly the same. The mass of blood continues the same as before,—its mode of distribution alone is altered. A less proportion remains within the arterial and capillary vessels, while an increase is made in the veins of the pia mater.

Perhaps this argument may become a little clearer if I remind
ou for a moment of the distinction that is usually made by scien-
sts between potential and actual energy. A stone lying on an
evated platform presses towards the earth with a force propor-
ned to its mass, but if the support be sufficiently strong, no im-
diate effect is perceptible. Lying on the platform the stone
ply presents such properties of inertia as it would exhibit on the
d ground. But if the support be withdrawn, it falls to the earth
h a force proportioned to the height of its descent. The mo-
tum with which it reaches the earth constitutes the actual
gy exerted, and it also constitutes the potential energy which,
rtue of its position, the stone possessed all the time it was lying
he platform. Now, the weight of the atmosphere bearing on
lood in the encephalic veins is a form of potential energy.
the brain is active, and its circulation is brisk, a certain
e of pressure exists, and the weight of the air, tending to keep
he blood within the head, produces no sensible effect. The
pressure within the vein is balanced by the support on its
al surface, and the movement of blood within it is steady and
But let the external support be diminished, and an oppor-
is then afforded for the potential to be converted into actual
Either the walls of the vessel must be sufficiently rigid
t the weight of the atmosphere, or the vessel itself must
the lateral pressure, and become more distended by the
lood being retarded. Here there is no opportunity for the
pressure in the arteries to bear with effect. The conditions
tivity have become unfavourable, and it must now await
f increased energy in the renewed activity of the mole-
nges.

e admitted that in certain conditions of the brain the bal-
he encephalic circulation is altered, the next step that
turally be taken would be to show that no such change

can take place without at the same time altering the balance of pressure in and on the brain.[1] As illustrating certain pathological conditions, this principle was long ago insisted on by Dr Abercrombie, but, except by Professor Bennett, its significance seems to have been overlooked by recent biologists. "As far as the explanation of morbid phenomena is concerned," says Dr Bennett, "the terms, 'changed circulation within the cranium,' and 'pressure on the brain,' are synonymous, as the one cannot take place without the other."[2] As this principle, however, is the necessary result of the fixed capacity and absolute fulness of the cranial cavity, it must equally apply to the phenomena of health. The energy exerted by a fluid does not depend alone on the impulse that is given to it, but also on the extent of area over which the impulse extends. In proportion, therefore, as a bloodvessel is increased in calibre, is the pressure of blood within it increased. Thus, if the area of brain-tissue in contact with a particular vein be doubled by the increase of the vessel, the pressure exerted by that vein, or rather by its contained fluid, will, in accordance with the law of equality of pressure in all directions, be also doubled. Of course, the pressure in some other vessels within the skull must be lessened to the same extent. On this tempting part of the subject, however, I cannot now enter. I have already made an attempt to apply the principle toward explaining the phenomena of sleep, but I have no intention to inflict a résumé of that argument on you here. I cannot conclude, however, without saying that whether or not I be wrong in the views I have now ventured to submit, or in the application of these I have elsewhere attempted, I am confident not only that they refer to a subject which deserves to be studied, but that in forsaking the track so well entered on and prosecuted by the Scottish triumvirate—Monro, Kellie, and Abercrombie—biologists have been neglecting a field of inquiry which is not more interesting than it is certain to be fruitful.

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[1] In the July number of this Journal, there is a paper "On the Non-existence of Pressure on, or Compression of, the Brain," by Mr Neil M'Leod. He remarks, "The brain is subjected to pressure between, on the one hand, the force of the blood; on the other, the resistance offered by the rigid bony wall of the cranium—an example of action and reaction. This wall, being rigid, cannot exercise *active* force on the surface of the brain; but force is always called into action in the form of resistance, which it offers to increased force from within." Throughout his paper, the author overlooks the fact, that there is a pressure of blood on the surface of the brain as well as through its substance. It must be remembered that the vessels of the pia mater are entirely outside of the nervous structures, and that they are being constantly flushed with rapidly-moving blood. Now, a fluid in motion must of necessity exert *active* pressure. If the distending impulse within the brain should, by any possibility, be sufficient to obliterate the layer of fluid which exists between the organ and its rigid envelope, instant insensibility must result. The cerebral circulation would be completely checked! I believe that some forms of epileptic seizure may be due to such an accident taking place over part of the brain's surface. The subject, however, is too wide to discuss in a footnote. I wish simply but strongly to insist, that energy, active in its nature and not due merely to passive reaction, is exerted at the surface of the brain, and that its amount will vary according to the rapidity of the blood's movement, or to the bulk of that fluid in the pia mater, or to the area of surface with which particular vessels are in contact.

[2] Library of Medicine, vol. ii.

ARTICLE III.—*Royal Edinburgh Asylum Papers. Hemiplegia in Relation to Insanity.* By H. HAYES NEWINGTON, Senior Assistant-Physician.

AMONG the more obvious derangements of the nervous system which are intimately connected with insanity, both in the origin and in the progress of a case, hemiplegia takes a very prominent place. Besides occurring as an accident that every person, sane or nsane, is liable to, it may, in some cases, be definitely assigned as he determining cause of mental disease, and in others, it may be he evidence of pathological changes taking place during the course f that disease.

I must, for convenience sake, extend the proper meaning of the ord hemiplegia, by making it include, not only the ordinary unteral paralysis, but also the condition, of whatever kind it may be, hich causes this paralysis.

We may divide roughly all cases of hemiplegia occurring in ylums into two classes—the first containing those where the zure is to be regarded as purely accidental, and having no ible connexion with the mental state; and the second em- cing those where the attack is the cause, result, or complication psychical disorder.

. It is only natural that, in a large population, each individual which labours under some form or other of brain disorder that, in ost all cases, implies a structural change, though we may not be to find it in all cases, hemiplegia should be expected to occur uently. I think that I shall not be taken to task for stating the commonest of the naked-eye pathological changes found in natic's brain is atheroma of the vessels. In the aorta, too, or the semilunar valves, patches of deposit are found in nearly y case that has been more or less chronic, and at very early . And yet, with all this predisposition to rupture or throms of a vessel, such an accident is not much more common in an m than out of it.

e must look, I think, for the cause of this comparative im- ty to the regular and restricted diet, the somewhat sedentary s of an asylum, and, above all, to the fact that, after a time, in cases, as the vessels become diseased, the emotions are blunted *passu*, and the vascular supply is therefore less liable to sudden rbances.

With regard to the remaining common cause of hemiplegia, embolism, geographical position has a considerable influence, through the production of rheumatic fever. The patients in the Royal Edinburgh Asylum enjoy great immunity from the latter disease, not a single attack having occurred in the last few years.

II. It is the second class of cases that I wish specially to discuss in this paper—those in which there is an obvious relation between the psychical and physical disease. Hemiplegia is not frequently given as a cause, but yet it happens often enough to have given a name to a variety of mental disease. This has been called paralytic insanity, and always assumes the type of dementia. It is to be carefully separated from the paralytic dementia, which the Germans use as a synonym of general paralysis of the insane. Dr Rayner stated at a late meeting, that he had had four such cases under his observation.

Like most other causes assigned for an attack of insanity, hemiplegia will not, single-handed, be sufficient. Predisposition, hereditary or acquired, is necessary. Alcohol may be regarded as a very likely form of the latter, tending, as it does, to produce both mental disorder and disease of the vascular system. This is well shown in the following case:—

CASE I.—A. T., æt. 54, was admitted three years ago. Mother died insane. She was a very heavy drinker, so much so, indeed, that she was placed in a Refuge on that account. Shortly before admission, she had an apoplectic seizure, and became excited. Since admission, has not shown much excitement at any time, and is now hopelessly demented. The left side is completely paralyzed; and it is a curious fact, that her sight grew gradually weaker, and she can now only recognise the difference between a light and a darkened room.

Hemiplegia may much more frequently be found standing in the opposite relation to insanity, *i.e.*, as a *result*. The ordinary form of a greater or less loss of consciousness and motor power, not recovered from for a long time, perhaps never, is decidedly rare as occurring after a bout of excitement or a convulsive seizure. This is much to be wondered at, considering the amount of stress put on the cephalic vessels by the active congestion induced by mania on the one hand, or the passive congestion consequent on a fit on the other. The injection of the conjunctivæ and the insane ear are strong evidences of the former, and the cyanosis of the lips indicates the latter.

But it is a very common thing to see, in walking round an asylum, a person "down on one side," limping along, and with decided obliquity of the tongue and inequality of the pupils. We may see this patient again, in the course of a few days, or even hours, and find him as free from motor trouble as any of his neighbours, and invariably we shall discover, on inquiry, that this patient has been restless or excited previously, has been noisy at night, or quarrelling, or has had an epileptic or epileptiform seizure. And these patients, too, we shall find to have been subject to insanity for some time back, or if not, to be of considerable age, young and recent cases never being affected in this way. The cases where this evanescent hemiplegia occurs must be divided into two classes, for though the paralytic symptoms are similar, yet there is, I think, a wide difference in the pathological conditions which cause them.

A. Cases where the paralysis is independent of a convulsion of any kind.

The following are illustrations. It must be remarked that, in some cases, hemiplegia of a more *permanent* form (in contradistinction to the *evanescent* attacks) has occurred, and the latter seem to select, though not constantly, the side on which the greater attack took place.

Case II.—A. E., æt. 64. Admitted a year ago. No history could be obtained; but this is not her first attack. Is much demented, and liable to attacks of excitement. Some time back, after one of these, it was discovered that she had slight hemiplegia, which rapidly passed off. She has since had several of these—not onfined to one side. Is now very infirm, and confined entirely to ed, but still has turns of excitement, as shown by her eagerness to lk. At times a slight aortic obstructive murmur is to be heard.

Case III.—T. G., æt. 66. Has been in the Asylum twenty-six ars. Was very dissipated before admission, and has since been ble to attacks of considerable excitement. Four years ago he had attack of hemiplegia, which did not last very long—he being le to grasp a stick next day—but his speech was affected for two nths. Since then has had similar slight attacks, which have n preceded by signs of excitement—such as bawling and using language in the grounds. The attacks have followed on the e side as the original one.

ase IV.—A. M., æt. 74. Admitted last year. A case of senile ia passing into dementia. Though never violent, she is one of most restless patients in the house, hardly ever lying down at t, or sitting by day. On the day after admission, she was seen partially paralyzed on the left side. This lasted but a short ; but whenever she has been more than usually restless, it ns on that side or the other.

se V.—M. B., æt. 53 at the time of her death, which occurred e beginning of this year. She had been in an asylum since When transferred to this Asylum she was demented. She able to attacks of excitement, such as crawling about the floor y to pick up imaginary pins, etc. After one of these she had ht hemiplegia, which likewise passed away shortly, but she veral others. At the time of death, she had been completely zed on the left side, though the right side had at times been d. The usual post-mortem changes were found, such as great atrophy and subarachnoid serous effusion at the vertex, etc.; but it was also found that the motor ganglia on each side were studded with small masses of blood about the size of mustard-seeds.

I conjecture that the hemiplegia in these and similar cases is due to the minute extravasation of blood into the optic thalamus and corpus striatum, which was so apparent in the brain of the last quoted case. The age and evidences of vascular disease, such as the tortuous and wiry state of the radial arteries, certainly predispose to such an accident. We have found in one case that such had occurred, and the appearances fully explain the symptoms during life. Nor is it difficult to understand why symptoms so pronounced should so rapidly pass away. An extravasation need not necessarily disintegrate brain-structure irremediably. If of small size only, it may tend rather to split up and separate, and not destroy, the nerve-fibres, leaving a good chance of their resuming their duties after a time, though, perhaps, at first the disturbance may be equally great. Besides, this disturbance is not alone due to the actual clot, but depends to a great extent on the modifications of the circulation brought about by it in its immediate neighbourhood.

There is one curious point certainly, which is, that though the effusions may be numerous, none of them should have attained any size. This is due, I think, to the fact that, though the sum total of the excitement that an insane brain of this class goes through may be considerably greater than that of a sane one, yet it is more evenly spread out, and rarely reaches to such an extreme as many of the events of ordinary life will produce.

B. Cases where a convulsion precedes the paralysis. This class is composed of epileptics, general paralytics, and patients suffering from adventitious products in the brain.

CASE VI.—J. P., æt. 64, admitted five years ago. Is epileptic, and has severe fits, which often occur in batches. A few days ago, after one of these, she was found to be hemiplegic (on the left side). She had also complete aphasia. This evidently did not arise from affection of Broca's convolution, and seemed to point to the medulla oblongata or pons, as the seat of its origin. The hemiplegia completely disappeared, but the aphasia was slower in its departure.

CASE VII.—D. S., a general paralytic, æt. 38 at the time of his death. When the disease had become pronounced, he had one day a long series of severe epileptiform seizures. No sooner was he fairly recovering from one than another came on; artificial respiration was resorted to several times. During the whole of this time, the right side was completely paralyzed and motionless, except that once or twice, during a severer convulsion, the arm was jerked. The convulsions left him, but that side was weak for a short time after; but five days after the first attack, a fresh series of fits came on, and on this occasion the left side was affected in a similar manner. Much to everybody's surprise, he got round again, and lived for four months after, the paralysis having disappeared. After death, nothing special was found to account for the unilateral paralysis. The vessels of the medulla were much dilated, and the organ was considerably congested.

CASE VIII.—F. R., æt. 53, a general paralytic. In this patient, after short excitement, there was a slight attack of hemiplegia, rapidly disappearing; and I should have placed him in the previous category, had he not been a general paralytic, and had he not shortly after been seized with a congestive attack. This also was ollowed by the same form of hemiplegia.

CASE IX.—J. H., æt. 53.—In this case, which I reported at ngth in the *Journal of Mental Science* (January 1874), there is very reason to believe that an intercranial syphiloma exists. I en mentioned that no paralysis had followed any of the epileptic izures to which she was subject. Since that time, however, on any occasions it has been noticed, the facial paralysis and interence with vocalization being especially marked.

No cases have convinced me so thoroughly as these of the truth Niemeyer's philosophical teaching concerning the part that serous sion from the cerebral vessels plays in producing paralysis. It ms to be his opinion, that by far the greater portion of injury e to the motor system is due to extravasation, not of blood, but m ; and nothing seems more probable than that such should be fact, when, as in epilepsy, there is great and long-continued sure exerted on diseased vessels, and when also no evidence æmorrhage or obstruction is found ; while, on the other hand, tation of the vessels and waterlogging of the brain-substance is ry common discovery. It is to this effusion occurring partially I would attribute the evanescent hemiplegia in this class of . What may be its seat can only be a matter of conjecture ; probably it is poured from the middle meningeal artery, which l, as is well known, is very liable to the various injuries that ce hemiplegia. Yet, in J. P.'s case (No. VI.) the peculiar ia suggests that the medulla oblongata or pons was similarly ed.

conclusion, the following are the points that I wish to draw ion to: 1st, That the insane are not much more liable than the to what we may call accidental hemiplegia; 2d, That hemi- often occurs in the former in close connexion with the insanity, quently as a cause (*a*), but generally as a result (*b*); 3d, That legia has a great tendency in the insane to recur often, to ited in its extent, and to depart quickly; and that there are istinct modes of its origin, though the symptoms are similar.

ARTICLE IV.—*Comparative Anatomy of the Arterial Cerebral Circulation in Animals and the Human Subject, as bearing on Parturient Apoplexy and Convulsions.* By Professor WALLEY.

(*Read before the Obstetrical Society of Edinburgh, 25th March.*)

FROM various causes, I have been led to inquire into the reason why the cow should be the subject of convulsive and apoplectic parturient affections, particularly apoplectic, while the mare, the sheep, the bitch, and in a great measure the sow, are free from them.

From remarks made at a meeting of this Society, now nearly two years ago, I became acquainted with the fact that puerperal apoplexy and convulsions occurred also in woman. This induced me to endeavour to explain why this affection, as also that of apoplexy, was confined mainly to woman and the cow. And after much thought, it occurred to me that some anatomical resemblance might exist in the cerebral circulation, which would satisfactorily clear up the matter.

I at once injected the arteries of the head of a heifer which I opportunely obtained, and dissected it, and was rewarded by obtaining a good view of the circulation. This dissection I have much pleasure in exhibiting to the members of your Society to-night, and also of explaining it. I may remark, that previous to this dissection I had not formed a distinct idea of the circulation of the brain in the ox; since its accomplishment Chauveau's work has been translated, and I find that he coincides with my anatomical description of these vessels, substituting, however, *réseau admirable* for *rete mirabile.* The main points of difference in the circulation of the brain in the five animals I have mentioned, and the point of resemblance in the circulation of the brain of man, are in connexion with the distribution of the internal carotid and the formation of the basilar artery and the circle of Willis.

In the horse, the vertebral does not enter into the formation of the arterial circulation of the brain, the basilar artery being formed by the junction of the cerebro-spinal branches of the occipital inside the theca vertebralis, gaining this point by passing through the two foramina at the anterior part of the wing of the atlas, forming thereby a curve of some importance in checking the force of the arterial flow into the cranium. Furthermore, the very act of meeting its fellow as it does at a right angle, and then dividing into a backward (*middle spinal*) and a forward (*basilar*) branch, is a material check on the force with which the blood is propelled into the cranial cavity.

The internal carotid, the other main factor in the cranial circulation, performs several tortuosities before entering the foramen lacerum basis cranii. After penetrating the dura mater, it makes one curve forwards and one backwards, and gives off the posterior communicating artery to join the basilar, and finally divides into the anterior and middle cerebral, giving off also an anterior communicating branch, which meets a similar one from the corresponding artery of the opposite side.

The ophthalmic artery anastomoses by its meningeal branches with the meningeal branches from the anterior communicating artery, but has little or no effect on the cerebral circulation.

The internal carotids, with the basilar posteriorly, form the circle of Willis, and at their internal flexure are united by a transverse branch behind the pituitary gland.

In the pig and dog, the basilar artery is formed by the cerebrospinal branches of the occipital as in the horse. In the former animal, the internal carotid passes into the cranium as in the horse, but forms with the ophthalmic and spheno-spinous (*meningeal*) artery a *rete mirabile* as in ruminants. In the latter animal, the internal carotid passes into the cranium, forms a peculiar curve, which leaves the cavity through the oval foramen, and re-enters it again after receiving a branch from the external carotid, but does not form a true *rete mirabile*.

In the sheep and ox, the vertebral passes into the spinal canal, at the hole of conjugation between the dentata and third cervical vertebra, passes forwards and anastomoses with the occipital (which gains access to the cranium, not through the atlas, but through the ondyloid foramen of the occiput), sending branches through the oramen in the wing of the atlas to supply the muscles of the cciput. These arteries then pass forward to form the basilar and tolerably large posterior plexus, on the basilar process of the ciput underneath the medulla oblongata, the spot in which terial rupture usually occurs.

The internal carotid is awanting, but is replaced by a large heno-spinous, or meningeal branch, which passes into the foramen erum basis cranii, sending backward branches to anastomose th the posterior plexus formed by the occipital and vertebral, and ward branches to unite with large arteries given off with the thalmic from the internal maxillary, and which gain access to cranium through the superior sphenoidal canal. From this on the *réseau admirable*, a dense plexus of minute vessels situ- l at the side of the sella turcica, and communicating with the c network in the opposite side, arises. Finally, the *réseau irable* originates trunks corresponding to the internal carotids, h unite with the plexus formed by the vertebrals and occipital, give off the three cerebral arteries.

e difference in the circulation in the ox and sheep, and upon h I base my theory, is, that in the ox each vertebral, ugh anastomosing with its fellow, proceeds forwards on its ve side of the spinal canal and opposite the atlas, sends off a branch to the posterior plexus formed by the anterior branches occipital and the posterior branches of the spheno-spinous; in the sheep the vertebrals pass into the spinal canal, inos late, proceed forwards as a single artery, again bifurcate, and anastomose with the occipital as in the ox. The posterior cerebral plexus is not, however, developed to the same extent, neither is the circulation so complex as in the ox.

The point to which I wish to direct your attention is, the existence of the plexus of vessels underneath the medulla oblongata in the ox, and the generally larger supply of blood to the brain in comparison with other animals; and further, the direct branch from the vertebrals to the posterior plexus to which I have referred, affords a direct channel of supply which does not exist in other animals. The affections of which I have spoken occur most frequently in short-necked, round-barrelled cows in a highly plethoric condition, the short neck favouring the blood-pressure through the vertebrals on the cerebral circulation, in the act of straining to give birth to the fœtus.

The point of resemblance in the human subject is, that (if I am rightly informed) the basilar artery is formed by the vertebrals, and apoplectic attacks are also most frequently seen in short-necked, stoutly-built subjects.

ARTICLE V.—*Effects of Improved Sanitary Arrangements on the Mortality of the Town of Leven.* By JOHN BALFOUR, L.R.C.S. Edin., I.G., Leven.

OF late years very much has been done to improve the sanitary arrangements, not only of our large cities, but even of comparatively small villages, by the introduction of efficient drainage, and a supply of wholesome drinking water; and it must be always most interesting to trace what effect these new arrangements have on the general health of the population in such places.

The town of Leven, in Fife, having had, in 1867, a very thorough sanitary overhaul (not before it was required), I propose showing, in a concise manner, what return the inhabitants have secured for the necessary outlay; and to do so I have, with the assistance of the Registrar, compiled tables showing the mortality for six years previous to, and for six years subsequent to, the change; but, before alluding to the results, I shall give a short history of the events which led to the improvement.

The town of Leven stands on the shore of Largo Bay, at the mouth of the river Leven, and is founded on a ridge of shingle resting on clay. What may be called the old town (in contradistinction to the new to the east, in an open space, and well-aired locality) consists of three principal streets running parallel to the shore, and of numerous cross lanes, courts, and closes, the buildings being generally closely aggregated. The water-supply formerly was drawn from various wells, which were sunk through the shingle into the clay. Originally, I have no doubt, the quality was good; but as comforts advanced, and cesspools were multiplied (all the more as these latter were built without other bottom than the shingle, so as to avoid the necessity for frequent emptying), the purity of this must have been gradually affected. No attention, however, was paid to this until the year 1866, in November of which year an outbreak of cholera occurred of a most fatal character. Samples of water from all the wells in the town were analyzed, and all were condemned, those of the worst character being found in the west end, where the epidemic was most prevalent. This being the case, immediate steps were taken to secure a sufficient supply of wholesome water, to have the town efficiently drained, and the roadways re-made and improved.

The new water-works were opened on the 23d November 1867, the drainage having been completed at the same time, and the relaying of the roadway and gutters soon after. The effect on the amenity of the place has been very great indeed, and the convenience of the water-supply so great, that those who remember the old state of things are inclined to wonder how they could have gone on so long without it.

To show the effect on the mortality, I take the years 1862 to 1867 inclusive (for the water having been introduced in November 1867 could not beneficially affect that year), as under the old regime, :nd 1868 to 1873 as under the new. I have thrown the whole 'ito tables, which show the lowered mortality in a striking manner: 'he total for the first period being 442 = 36·83 per thousand of ıe population, or, rejecting the 69 deaths from cholera in 1866, 73 deaths = 31·83 per thousand; while, for the last six years, the ortality has been 273 = 22·75 per thousand.

It will be observed, also, that this reduction of mortality extends every age, and through the whole class of zymotic diseases. nong the latter, it is certainly noteworthy that, whereas in the ıt period, ten deaths are reported from diphtheria, not one has 'urred during the second; also, that we have been free from an break of scarlatina during the whole second period. It must be supposed that we have been altogether free from the lastıed disease. There have been severe outbreaks in villages all ut us, and we have had single cases now and again, but no h has occurred, and the disease has never taken root. As to rhœa and dysentery—diseases which, though not always deling on, are certainly greatly aggravated by, a bad water-supply e deaths in the second period are exactly one-half of those in the

ıese results are encouraging, and worthy of being recorded, and, ·, not a little has been gained. Should, however, an epidemic olera ever again visit the land, and we, by God's blessing on etter arrangements, are kept free from a pestilence which once gain has fallen very heavily on the place, how much misery ıffering shall we not have escaped!

TABLE *showing the Comparative Mortality at different Ages at Leven for Two Periods of Six Years: also from Zymotic Diseases, and from Diarrhœa, Dysentery, and Cholera.*

Mortality as regards Age.	1862.	1863.	1864.	1865.	1866.	1867.	Total for Six Years.	1868.	1869.	1870.	1871.	1872.	1873.	Total for Six Years.
Under 5 years, .	30	13	20	24	38	26	151	20	12	8	26	6	5	77
From 5 to 14 years inc.	4	1	4	3	7	10	29	4	3	1	2	1	4	15
„ 15 to 29 „	1	3	6	1	14	4	29	5	2	...	6	3	5	21
„ 30 to 59 „	16	14	11	8	49	9	107	12	9	10	10	12	9	62
„ 60 to 79 „	10	18	21	14	22	7	92	19	4	16	9	8	13	69
„ 80 and upwards,	2	7	7	9	4	5	34	7	3	6	3	3	7	29
Total in each year,	63	56	69	59	134	61	442	67	33	41	56	33	43	273
Zymotic diseases:—														
Fevers, . .	...	3	1	3	2	2	11	4	2	...	...	...	2	8
Diphtheria, .	1	...	6	1	1	1	10	...	...	...	...	...	...	...
Smallpox, . .	...	...	3	...	...	...	3	...	...	...	...	...	...	...
Scarlatina, .	...	...	...	...	...	17	17	...	...	...	...	...	...	...
Measles, . .	6	1	...	3	2	...	12	...	2	...	7	2	...	11
Hooping-cough,	4	...	...	3	...	...	7	...	...	...	3	...	1	4
Erysipelas, .	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total, .	11	4	10	10	5	20	60	4	4	...	10	2	3	23
Diarrhœa & dysentery,	1	...	3	5	4	5	18	6	...	1	...	2	...	9
Cholera, . .	...	...	...	...	69	...	69	...	...	...	...	...	...	...

ARTICLE VI.—*Claws of Felidæ.* By J. FAYRER, M.D., F.Z.S.

WHEN recently making a dissection of the apparatus by which the feline claws (generally kept in a state of complete retraction) can at the creature's will be unsheathed, and used as formidable weapons, by which frightful wounds are inflicted, I was struck by what appeared to be a peculiarity in the anatomical arrangements, which, so far as I know, has not hitherto been noticed. I allude to the position assumed by the ungual, with reference to the second phalanges of the hind-foot. The subject was an Ocelot, *Felis Pardalis.* I have repeated the observations on the common cat, and find that it is the same as the ocelot in respect of its claws. In the cats I have examined, then, I find that the ungual phalanges of the hinder feet are not retracted *upon*, but by the side of the second phalanges, as in the fore-foot, and that the only difference between the fore and hind foot, as far as regards the position of the phalanges, is, that in the hind-feet the obliquity of the retraction of the distal on the second phalanx is less than in the fore-foot, and that there is a slight modification of the ligamentous arrangements.

Professor Owen, in his "Comparative Anatomy and Physiology of Vertebrates," says, at pages 69, 70, vol. iii., speaking of the lion—"In the toes of the fore-foot the last phalanx is retracted on the ulnar side of the second; the principal elastic ligament arises from the outer side and distal end of the second phalanx, and is inserted into the upper angle of the last phalanx. A second arises from the outer side and proximal end of the second phalanx, and passes obliquely, to be inserted at the inner side of the base of the last phalanx. A third arises from the inner side and proximal end of the second phalanx, and is inserted at the same point as the preceding."

"*The toes of the hind-foot are retracted in a different direction*, viz., *directly upon*, *not by*, the sides of the second phalanges; and the elastic ligaments are differently disposed. They are two in number, arise from the sides of the second phalanx, and converge, to be inserted at the superior angle of the last phalanx."

The description given by Professor Owen of the lion corresponds exactly to that of the ocelot and cat, inasmuch as the fore-claws are concerned, but it does not appear to answer to that of the posterior claws, as will presently appear.

The author of the article "Felidæ," in the Cyclopædia of Natural History, vol. ii. pp. 744, 745, remarks, "This state of retraction is constantly maintained, except when overcome by an extending force, by means of elastic ligaments. The principal one arises from the outer side and distal extremity of the second phalanx, and is inserted into the superior angle of the last phalanx. A second rises from the outer side and proximal end of the second phalanx, nd passes obliquely, to be inserted at the inner side of the base of he last phalanx. A third, which arises from the inner side and roximal extremity of the second phalanx, is inserted at the same oint as the preceding."

"As the phalanges of the hind-foot are retracted in a different irection to those of the fore-foot—that is, *directly upon and not by the de of the second phalanx*—the elastic ligaments are differently dis- sed. * * * The outer ligament is of a flattened triangular rm. It arises from the whole outer side of the middle phalanx, strongest at the anterior margin, and is inserted at the superior gle of the last phalanx. The inner ligament is of a rounded m, arises from the inner side and distal end of the second alanx, and is also inserted at the superior angle of the last alanx, which is necessarily drawn back in the diagonal of the stic forces."

would merely remark on this, that it is said to apply to the cat e generally; but that, as it corresponds to Owen's description he claws of the lion, it may really be meant to apply only to t animal. With reference to the peculiarity, if it really be one, he hinder claws of the ocelot and cat, it would appear that it ts in obedience to the law which regulates the adaptation of organs to the purposes they are especially intended to serve; and that, therefore, an arrangement which would be teleologically purposeless in the larger felidæ, finds a place in those where it conduces to their welfare. And this may be, that as climbers they require greater strength in the hind-feet, greater retractility, and a more sharpened condition of the hind-claws than are needed in the lion and tiger, which do not climb trees. There may be other better reasons, but I suggest this as a probable one.

I have not, since my attention has been directed to the subject, had the opportunity of examining the lion or tiger's foot as a whole; but, from inspection of its skeleton, it appears that the difference between the fore and the hind phalanges is considerable. I venture, however, to express a doubt whether it be so complete as the description which I have quoted would imply.

The only differences that I find in the position of the ungual, with reference to the second phalanges in the fore and hind feet of the ocelot and cat, are as follows:—

Fore-foot.—The ungual phalanx is retracted obliquely on the ulnar side of the second phalanx, and it is kept in that position by a strong round bundle of elastic ligament which arises from the ulnar side of the distal end of the second phalanx, and is inserted into the upper and posterior part of the angle of the expanded ungual phalanx, close to where the claw is fitted into the groove in that bone. There is a band of ligament on either side, which arises from the proximal end of the second phalanx and also from the extensor tendon, and, passing forwards, is inserted into the distal phalanx on either side of it; the round elastic ligament being between them. The lateral ligament is strongest on the ulnar side.

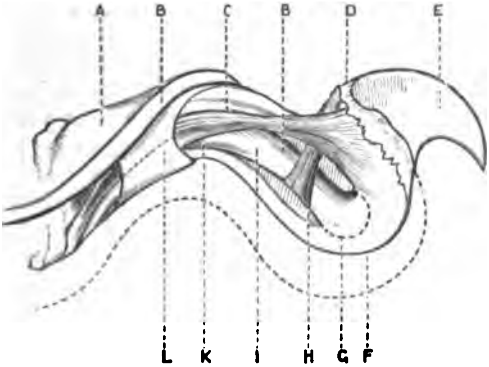
The elasticity of the round ligament is so great, that even in the dead foot it keeps the claw firmly retracted. The extensor tendon, which is inserted into the posterior aspect of distal phalanx just above the articulation of that bone with the second phalanx, steadies the claw when it is extended. The direct and powerful exsertion of the claw is effected by the action of the flexor perforans, which passes under the convex base of the distal phalanx to be inserted near its anterior aspect. The leverage is such as to cause very rapid action.

The Hinder Claws.—The second are, relatively to the first phalanges, longer than in the fore-foot. The claws and ungual phalanges are retracted rather less obliquely than in the fore-foot, but still they lie by the side of, and *not upon, the second phalanges.* The round elastic ligament is the same, and the only difference of any importance in the lateral ligament is, that that on the ulnar side is more developed than the corresponding ligament in the fore-foot. The tendinous arrangements seem, as far as the claws are concerned, to be alike in both hind and fore feet.

The hind-claws are slightly blunted, as they are more frequently brought in contact with the ground, and hence the same polished point is not possessed as in the anterior claws. With reference to the lateral ligaments, it is to be observed that they consist of some marked tendinous bands, which form part of a general ligamentous capsule, which envelops the parts from the second to the ungual phalangeal joint, but most strongly in the ulnar side.

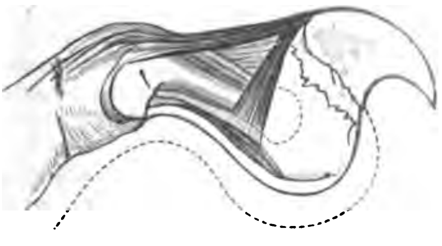
The chief power of retraction appears to lie in the round ligament. This, no doubt, is aided by the lateral ligaments, which are probably, to some extent, elastic also. The extensor tendon must also aid materially in initiating the action which is passively maintained by the round ligament.

Feline Claw (Ocelot), partly extended. Fore-Foot.



A. Proximal phalanx.
B, B. Extensor tendon, helps to steady the claw.
C. Lateral ligament.
D. Fold of claw-sheath.
E. The claw.
F. Distal phalanx.
G. Flexor perforans tendon, unsheaths the claw.
H. Elastic ligament, keeps the claw retracted (round ligament).
I. Second phalanx.
K. Flexor perforatus.
L. Annular ligament.

Feline Claw (Ocelot), partly extended. Hind-Foot.



ARTICLE VII.—*An Obstetric History: A Vesico-vaginal Fistula, with Subsequent Conceptions.* By A. E. M'RAE, C.M., M.D., Penicuik.

(*Read before the Obstetrical Society of Edinburgh, 8th April.*)

THE operation for vesico-vaginal fistula is not of very ancient date. The fertile brain of John Hunter is said to have given birth to the idea, but many years elapsed before the attempt was made to close the fistula between the vagina and the bladder caused by protracted labours. Dr Drew of Tunbridge Wells performed the first operation. The success of the case was made known at Guy's Hospital, and soon the operation became famous. Nowadays, there are few hospital surgeons but would try the operation. It ranks with the higher class operations in the modern department of plastic surgery. The good it has done to weak suffering humanity has been very great; and if the sufferers were to lead a celibate life after the operation, no doubt it might be an unmixed blessing. Unfortunately, however, this cannot always be so, and the artificial condition being only a substitute for a better state of things, the compromise is not equal to every exigency. What is a blessing in one circumstance, may become a curse in another; and if the plastic operation of closing a vesico-vaginal fistula may relieve a condition of things which "renders life but a long disease," the processes of gestation and parturition subsequent may be fraught with great peril. Within the last year or two, I have met such a case, and as the history appears to me to be unique, I venture to lay it before you. Besides illustrating the above-mentioned point, it also indicates the benefits of scientific skill, and its opposite, the direful consequences of drivelling midwifery.

Mrs C——, aged 21, was seen by my neighbour Mr Cox, on 26th October 1871, at 4.30 P.M. He found her in labour with her first child. She had been in this condition for the previous two days and nights, and had been treated with opium; but her medical adviser had neglected the conduct of the case. Mr Cox found her unconscious, with stertorous breathing. The head was impacted in the brim. Delivery was effected by means of the forceps, with very great difficulty, at 6 P.M.

At 9 P.M., her condition was very unsatisfactory, and Dr Drysdale, who happened to be living in the neighbourhood, was called in. The patient was still comatose. The bladder was found to be distended, and the catheter was used. She gradually came out of the comatose condition, and subsequently made a fair recovery; but a vesico-vaginal fistula was found to exist. On the 14th December, she was sent to the Edinburgh Royal Infirmary; and in the records of that institution exists the following entry:—"Margt. C——, aged 21, about seven and a half weeks ago, was delivered of a [illegible] child by instruments, and vesico-vaginal fistula followed.

"15th December.—Cicatricial tissue around fistula was removed, and the fresh edges brought together by five silver-wire sutures. Sigmoid catheter kept in urethra.

"24th December.—Catheter removed.

"29th December.—Stitches removed.

"31st December.—Dismissed cured, sixteen days after operation."

I understand Dr Joseph Bell was the operator.

In the spring of the following year, 1872, she again fell with child, and on the 7th September she was seen by Mr Cox at 11 A.M. He found that she had had severe uterine pains since the previous midnight. On examination, no presenting part could be made out. The pains were very severe, and almost constant, although little or no uterine action could be detected. The pulse was 90; the tongue foul and loaded.

At 1 P.M., Mr Cox requested me to see the case with him. I found the woman in great agony, with constant and severe pains. On examination, I experienced great difficulty in making out the position of the os. Far up on the anterior wall of the vagina, a tumour about the size of a small orange existed. The lower edge of this mass felt continuous with the anterior wall of the vagina. The upper edge was attached to the posterior wall, and felt continuous with the body of the uterus. The tissues from the posterior wall to the anterior, and for some distance downwards, were in a state of extreme tension; but no os, as usually found, could be detected. A very slight depression could just be made out about half an inch from the point, where the tumour united with the anterior wall. Around this hollow existed an annulus of denser, more compact fibres, but nowhere could any patency, by repeated and careful examination, be discovered. The pains being constant, this tenseness showed no tendency to relax. Externally, a hard and well-defined tumour was easily made out, occupying the ordinary position of the pregnant uterus, extending nearly to the umbilicus. It was hard, well-defined, and seemed in a state of contraction.

It was at this period I learned, that on her first pregnancy she had been attended by her own medical man, who administered opium, sat the most part of a night with her, left, and neglected to return. On the third day, Mr Cox was called in, and found the woman comatose, and the head impacted in the brim, as stated above. How long she had been in this condition it was impossible to say, but the result was a difficult forceps extraction, and a vesico-vaginal fistula. The cicatrix consequent upon the operation for the cure of this condition had considerably contracted, and there had also been to some extent a loss of tissue, caused firstly by the pressure and subsequent sloughing, and secondly, by the paring of the wound preparatory to the operation. This combination of causes all operated in the same direction, in decreasing the quantity of tissue in the region between the cervix uteri and the anterior vaginal wall. In fact, this region was completely obliterated. In consequence of this, the dilatability of the parts was very materially interfered with. The total occlusion of the os, however,was more difficult to explain, and at this stage of the history I was totally unable to account for the condition. It was quite possible for a patency to exist, although I could not make it out.

This condition of things was somewhat perplexing, and it was not lessened by the extreme state of exhaustion that existed with the condition of extreme uterine action. The whole nerve-force seemed to have left the body generally, and become concentrated in the nerves of the uterus. It was evident, therefore, that our first duty was to correct this state, and restore the equilibrium of the distribution of nerve-force—that is, to take from the womb what was in excess, and restore it to the other parts of the body. It was necessary also to temporize a little, so as to allow the woman to gain strength, and prepare her for her duty, and for any surgical interference that might be found necessary. It was therefore thought expedient to administer 20 grains of chloral hydrate, to be repeated if necessary, and to have the parts bathed frequently with tepid water, if possible.

At 3 P.M., she was rather easier. The pains were not so constant, nor so severe, and she had slept a little, having had only one dose of chloral.

At 6 P.M., she was pretty much in the same condition. The parts were dry and hot. I thought it now advisable to administer opium instead of chloral, fearing cardiac exhaustion. I advised an abundant use of tepid diluents, also 30 minims of tinct. opii, to be repeated at 9 o'clock if necessary.

At 11.30 P.M., she expressed herself as feeling much better; had slept occasionally, and has had only a little pain at times. The parts were very hot; no patency could be detected. The tension, however, was not quite so great, and I could detect the head presenting. The parts were still very hot. The opium and diluents were continued, and a glass of castor-oil was ordered for the morning, as the rectum seemed to contain some scybala.

8th September 10 A.M.—Had passed a good night. Pulse 120. Perspiring freely; tongue still loaded. Had passed water in quantity. Bowels not opened. Complained of some pain. No alteration in condition of parts, but patient feels stronger. Co-ordination of nerve-force, seemed therefore improving. To have another dose of castor-oil.

3 P.M.—Pulse 120. Bowels opened. Great heat of skin. Some tenderness on pressure in right iliac region. Has slept a little. Parts hot, but moist for first time since commencement of labour.

7 P.M.—Parts more relaxed. Os somewhat definable, but no patency could yet be discovered, although, on account of the thinness of the posterior part of the cervix, the head could be detected presenting.

11 P.M.—Made an examination under chloroform, when something like an os could be detected, about the thickness of a sixpence, but a membrane firm and dense stretched across the os; no patency could yet be made out. This membrane stretched from the anterior wall of the vagina—representing in this case the anterior lip of the os—to the posterior lip, and was inserted into, or rather was attached to, the cervix, about ½ inch above the lip of the os. I attempted to rupture this membrane at all points of its surface, especially at its posterior union, but failed.

9th September at 12.30 A.M.—An aperture that could admit a crow-quill was discovered in the centre of the posterior edge of this membrane, but the membrane and the posterior edge of the os were too tense and unyielding to admit of dilatation. It was now time, however, that some action should be taken, for there was little chance of the fœtus being alive, seeing that the uterus had been so many hours in a state of rigid contraction. It was necessary, therefore, that delivery should be effected, and that speedily, as the woman's condition was becoming somewhat critical. We again put her under chloroform, and with a curved scissors, one blade of which I passed into the uterus through the crow-quill aperture, I cut the membrane in two places, extending the wound into the cervix, carefully avoiding the old cicatrix, and cutting only into uterine tissue. A third wound was made into the posterior lip, for about an inch into the cervix. The orifice thus made was immediately filled by the membranes, and there was no hæmorrhage. The head was easily made out presenting; it was of small size. We now waited for some time, but as no pains supervened we gave 30 m. tinct. op., and left, with orders to be sent for should pains come on.

At 4 A.M.—Mr Cox was called, and finding no advance he gave first one then another dose of tincture of ergot to increase the pains, as the general strength was failing.

At 5 A.M.—The fœtus, small as it was, became impacted, and the pains were powerless to expel it. Forceps were now used, and a dead fœtus of about five months was born. There was no particular hæmorrhage, but the placenta could not be removed.

At 9.30 A.M.—I again saw her, and found an hour-glass contraction, with the placenta retained in the upper chamber. We put her under chloroform, and with some difficulty I passed my fingers wedge-shaped-fashioned through the constriction, and succeeded in detaching the placenta, which was adherent in some places. Very little hæmorrhage occurred, and with kneading the uterus contracted fairly.

In the evening she felt comfortable. Pulse 112. Perspiring freely; had passed water, but the uterine discharges are scanty. We ordered hot fomentations and abundance of farinaceous diluents. From this period she rapidly convalesced.

12th August 1873.—Mr Cox was again sent for at 10 P.M., and found that the waters had broken in the morning, after some hours of pains. On examination he found the os again completely occluded. As the pains had no effect on the uterus he left, and called next morning. The patient said she had felt motions during the night, and had slept a good deal. The condition of parts was unchanged.

At 5.30 P.M.—The pains were very severe, and there was some uterine action present, but no patency could be detected.

At 7 P.M.—I saw her, and on examination could detect no orifice in the uterus. Ordered her a large dose of tinct. op. (ʒi.), and ʒss. to be repeated at midnight.

14th August.—Had felt motion during the night. A well-defined os existed, and was about the size of a florin. I ordered diluents, and the os to be dilated with the fingers. At 11.45 A.M. the os was fully dilated, and the pains were very severe. About mid-day, as the head would not descend, Mr Cox gave her chloroform, and finished the labour with forceps. The child was a large full-grown male, and died immediately on being born. She made a good recovery.

23d March 1874.—I called to-day and was kindly permitted an examination. I found that she had been ailing for several days with severe pains in the lower parts of the belly, and she was afraid that she was going to have another miscarriage; for she was again four months gone with child. These pains had been preceded by a long period of costiveness, and the alimentary tract seemed greatly out of order. For this condition her own medical man was advising remedies.

On passing the finger into the vagina the top of the tube was reached at a distance of 2¼ inches from the external orifice; there was no depending cervix, and no anterior nor lateral culs-de-sac. The posterior wall of the vagina was much less concave than usual. The anterior was occupied by a hard, almost unyielding, tumour, extending from about ½ inch behind the os urethræ to the tip of what should have been the posterior cul-de-sac. It was slightly convex, the convexity looking towards the sacrum. A considerable amount of tension also existed along this convexity, for the surface was very smooth, and the os urethræ felt as if it were dragged upon. Midway between the two extremes of this convexity there is the tip of the cul-de-sac and the union of the tumour with the anterior wall of the vagina proper; with some difficulty a very narrow slit could be detected, into which only the nail of the forefinger could be inserted. It was about ½ inch long, and extended transversely across the face of the convexity. Externally a large tumour was found occupying the normal position of the gravid uterus, reaching superiorly to within an inch of the umbilicus.

On the evening of the same day I was requested by Mr Cox to see her again. On arrival I found that she had had several attacks of hæmorrhage from the uterus, and that the discharge, though not in large quantity, was accompanied with severe uterine pains. The os was now more readily detected, and felt as if it could admit a sixpence sideways. No hæmorrhage now existed. The bowels, which contained masses of scybala, had not been opened for some days. I ordered a wineglassful of castor-oil, and rest in bed. The symptoms did not recur, and she is now walking about quite well.

This melancholy history speaks for itself, and therefore needs few remarks from me. I have searched the records of the past fifty years, but cannot find a similar case. The condition of rigid unyielding os is far from rare, and cases of complete occlusion of the os, from organization of the plug, or maldevelopment of the tissues of the cervix uteri, are recorded, in which it was necessary to enlarge the os or pierce the membrane and divide the cervix in order to permit the contents of the uterus to be expelled. But I have seen none where a rigid os, an organized membrane, and a want of dilatable tissue combined to frustrate the efforts of the parturient uterus. In operating I had to bear in mind that the incision would become a rent, *i. e.*, more extensive,—that, indeed, there was no limit to this extension, except the necessities of the descending fœtus. I avoided the anterior wall, as there was more tissue to work upon on the posterior wall of the cervix, and less chance of the tear therefore extending into the bladder; although, had the head been larger, there was a danger of the rent extending to the peritoneum. Either way there was danger, but it was necessary that the woman should be delivered with the least possible risk.

(*To be continued.*)

ARTICLE VIII.—*On Local Hygienic Influences.* By J. BOYD, M.D., Slamannan.

IN so small a country as the Lowlands of Scotland, very considerable diversity of climate, depending upon greater or less elevation above the sea-level, nature of the soil, state of cultivation, and inclination of surface, may be observed. Taken in a broad and general way, it may be divided into two distinct regions:—

1. The flat low-lying or carse districts, which include the alluvial valleys in the middle course of the principal streams, the carses of Stirling and Falkirk on the Forth, of Gowrie on the Tay; the northern part of Renfrewshire on the left bank of the Clyde at and below Glasgow; a large extent of West and Mid Lothian. Strathmore and the Howe of the Mearns may be included in the same description. For fertility, high cultivation, wooding and water, amenity of scenery, and balminess of air, the tracts of land referred to may compare advantageously with any other portion of north-western Europe. The roads, the edifices, the trim enclosures and belts of plantations, the plentiful sprinkling of public works,

of churches and schools, all bear evidence of a prosperous and well-doing population. Yet in these favoured regions, where spring beams earliest and autumn lingers longest, the standard of health is not always the highest. Not only in the towns, but in the villages therein situated, zymotic epidemics make their appearance before and continue after their departure from the colder, damper, and higher-lying localities.

As a specimen of the climate of the carse districts, I subjoin an abstract of meteorological observations made during the year 1873, at Annanhill, near Kilmarnock, by W. H. Dunlop, Esq., which affords valuable and strictly reliable data for comparison. This gentleman's residence is 165 feet above the level of the sea, from which it is distant 6·125 miles:—

Mean temperature of year, 47·1°.

Hottest month, July; coldest, February; driest, April; wettest, October.

Wind-point of greatest frequency (80 days), W.S.W.

No. of days on which gales occurred, . .	28
" " rain fell, . . .	209
" " no rain fell, . .	156

Total depth of rainfall for year, 39·60 inches.

Mean quantity of ozone registered in 24 hours during year, 5.

No. of days in which night temperature fell below 32° Fahr., 62.

Hottest day (23d July), average temperature, 70·1°.

Coldest day (21st January), average temperature, 27·5°.

I lately asked an eminent practitioner in that neighbourhood, What malady his experience led him to regard as most prevalent and special to his district? He replied, "Phthisis." This well-grounded statement contrasts remarkably with my own cases, which vary in number from three in two years to two in three years.

2. The Muirlands. Standing on some elevated point rising abruptly from the plain—as, for instance, the Esplanade of Stirling Castle—the observer will perceive a range of uplands stretching like a wall on the south and trending westwards. This is the beginning of the muirlands, which, ascending gradually from the site where the Forth and Clyde Canal replaces the Roman wall which bisected the island, extend more or less continuously to the English border. Rising from 500 to 700 or 800 feet above the sea, these muirlands roll upwards and onwards till in many places they culminate in elongated ranges of trap hills, and constitute the second and larger division of the Lowlands.

The distinguishing characteristics of this division are exemplified very clearly in the parish of Slamannan, to the medical charge of which I was appointed twenty years ago, and a delineation of its hygienic condition may give a better idea of these upper countries than less specific generalizations could possibly do. The tract in question may be described as a series of ridges and intervening hollows running parallel to the easterly course of the Avon, which forms its northern boundary, and the name of this stream may be held as pointing to an original Cymric rather than Gaelic stock. A good notion of the situation of the place is afforded by the fact that at a strip of road 2½ miles S.W. of the village, where the *floating moss* first broke out, the water in the north ditch empties itself into the Forth, while that in the south flows ultimately into the Clyde. At least 10 per cent. of the surface of the parish is covered by peat mosses varying in depth from 3 to 30 feet, occasioned, it is locally believed, by the Noachian Deluge—although I could never get a very definite answer to the question as to whence the great flood could have brought the trees that in their decay produced these mosses, seeing that the roots and boles, found plentifully in them, are of larch and birch, precisely the same timber that flourishes best in the locality at the present day.

Till within the last thirty years the population—under 1000—was exclusively agricultural, and occupying small dairy-farms of 100 acres or thereby, living for the most part in long low ranges of thatched buildings, the family at the one end, the barn at the other, and the cows and horses between. These farm-steadings were certainly a shade better than the black native wigwams of the remote Highlands, and being generally set on knolls or ends of ridges, had a water-descent on at least three sides. But dampness, nevertheless, was their prevailing characteristic; the *spence* or parlour being rarely and insufficiently fired, and moisture ascending from the floor, on the same level as the outside. The kitchen, with its box-beds, and the altar-like fireplace, with settles all round, was not uncheerful, while the smoke that did not find its way up the open shaft-vent, helped to kyanize and thereby obviate the deleterious influence of the decaying thatch that constituted the roofing. The wells being generally at some distance from the steading, the calcareous or chalybeate water, being furnished by a natural spring, did not usually generate any typhoid distemper; but when typhoid, typhus, or scarlatina once broke out, they went through most of the family, which seldom escaped without the loss of one or more of its members. Among the older males, chronic rheumatism from the cold damp climate, and carelessness in sitting in wet clothing, stiffened and twisted their spare and weather-beaten corporations into ungainly angular shapes. At the summit-level of the district, near the Black Loch, where one patriarch recently departed, for whom 103 years were claimed, some of his grandchildren and a number of their relatives and neighbours succumbed to an outbreak of diphtheria which prevailed nowhere else. This was the first time so mortal a malady was satisfactorily diagnosed, although it is very possible that in former times many may have been carried off in the same manner, but the cause of death unrecognised.

With these outbreaks duly allowed for, the farming class may be stated as pre-eminently healthy and long-lived; their open-air avocations and generally regular and temperate habits securing them from many sources of diseases which affect the civic and artisan population. It may be observed, however, that in those somewhat advanced in life dyspeptic complaints were not uncommon, possibly arising from too much uniformity and simplicity of diet in their younger days, when oatmeal and milk, herrings, cheese, and potatoes, formed the staple aliments. It is interesting to the historic student to perceive how such remote events as the Plantagenet wars, four, five, and six centuries ago, with the resulting hardship, famine, and poverty, should have left traces to such recent date on our Scottish dietary, habits of thought, and expression: when a full succulent meal was considered to be something questionable if not disreputable, and the exclamation, "Ye're owre het and fou-hadden," was meant and felt to be a bitter reproach. To the same source, with the consequent tone of self-denial, proud endurance, and self-relying penury, we may ascribe the circumstance that an ordinary Scotsman seldom thinks or speaks about his dinner unless when the meal is in actual progress, and nourishes a secret and genuine contempt for those who do.[1]

The Slamannan Railway, formed about the date referred to, merged immediately in the Monkland line, and with it now constituting the paying portion of the North British Railway, affords in every respect a complete contrast to the southern branches of that gigantic enterprise, especially those about Tweedside, where the eye of the passenger is delighted by the picturesque and sequestered scenery, unless it be dimmed by tears of sympathy for the unfortunate shareholders! This event completely revolutionized the parish, and by opening up the coal-measures quadrupled the population and centupled the circulation of money. Along the railway and its ramifications a series of coal-pits from 20 to 40 fathoms in depth—in one or two instances, 50 fathoms—were excavated. Each colliery necessitated the construction of a mining village, composed almost entirely of brick rows of single apartments, with a small proportion of double dwellings for the accommodation of the miners and their families.

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[1] *En passant*, it may be observed that the hospitality and kindness of the agricultural class form a cause of danger to medical practitioners, to which it may not be inappropriate to refer. The doctor reaches the farm-house and sees his patient, examines, and prescribes, somewhat cold, damp, and fatigued. A glass of whisky is brought forward and imbibed; he is presently warmed and comforted, and sits and converses for a time. He rides on to another rustic homestead some miles distant, and a similar dose is administered with similar results. Every alcoholic atom calls for a brother, and the appetite grows on what it feeds upon. In this fashion the strange anomaly is too frequently presented that a well-intentioned member of an honourable and learned profession becomes ultimately degraded and demoralized by too intimate contact with a sober and decent class of the community. From the more rarefied atmosphere of miners' houses, no such risk is encountered there: spirituous evaporation goes on with such rapidity that the bottle is speedily dry.

The oldest of these habitations in connexion with the first established works were some of the most miserable edifices I ever had occasion to enter: the walls 14 inches thick and 7½ feet high; the distance from the two bedsteads to the fireplace 9 to 10 feet, by 12 from back-window to the door; the floors invariably composed of lime and mine-dust, which successive tenants broke into a honeycombed network of holes admirably adapted for the production of fractures and dislocations. The population of these dwellings averaged each 2½ males between husband and lodgers, besides wife and children—the latter in anti-Malthusian swarms. In such confined cabins all the household operations—such as washing, ironing, cooking, and baking—had to be carried on, not to speak of the personal ablutions of the workmen on returning from the pit, the drying of pit clothes, etc.; the only redeeming sanitary condition being the constant renewal of air by the open doors, and the large fires that blaze at all hours and all seasons. But privacy and peace, unless in the case of newly-married couples—and these generally obeyed the gregarious instincts of the class by taking in lodgers—were altogether unattainable. The depressing influence on the human constitution by the nocturnal exhalations inevitably produced by such a state of matters was very perceptible in the craving for change and excitement by frequent migrations and Bacchanalian bouts, so common as to be unheeded; and for which, in most cases, they were more to be pitied than blamed.

Shortly after commencing professional labour here, I was struck with the extremely frequent occurrence of cases of diarrhœa and dysentery. Few strangers arrived without suffering within the second week, if not the first, from smart alvine derangement; and among children teething, catarrh, heats, improper food, or any other morbid agency, seemed inevitably to result in profuse, foul-smelling fæcal discharges, accompanied by flatulence and frequent vomiting. The pale and languid countenance, the sudden and extreme debility, and general depression gave me the idea of the system being acted upon by some narcotico-irritant poison, internally generated; and that the leading symptoms were so many indicia of the efforts of ature to react against and expel the noxious influence, whatever hat might be. The tympanitic distension of the abdomen pointed o gaseous exhalations—the results of decomposition of ingesta and ucous secretions—easily absorbed into the capillary network that ervades the vascular mucous membranes.

Whether feasible or not in Deutschland, the *perfervidum ingenium cotorum*, as perceptible in infancy as in mature age, would pro- ably render impracticable any direct experiment in the way of llecting the generated flatus in a pneumatic trough; but it curred to me that from sulphuretted hydrogen being well known a source of danger in emptying cloacæ, and that many of the cidents thus arising have been referred to inhalation of this gas, presence in the colon and small intestines was the *origo mali*;

while, to ascertain this, the use of the familiar reagent, acetate of lead, would set the matter at rest. Accordingly I administered that salt in doses from half a grain to a child of three months, up to five or six grains in an adult, every four or five hours; and was gratified to find diminished discharges, and these on the following day of the black colour of sulphuret of lead. As in the majority of instances of more than two days' continuance the tenesmus superinduced bloody mucous discharges, after a time I thought it well to continue the acetas plumbi with Dover's powder—the pulv. ipecac. comp. in equal proportions; and the success of this treatment exceeded my highest expectations. As if by some talisman, the aspect of tranquillity and comfort replaced that of dreamy depression: the hollow eyes became lively, the colour returned to the cheeks, the patient dozed peacefully or slept quietly and awakened refreshed. Where vomiting was present I premised a sinapism to the epigastrium, and forbade the cold-water drinks so much craved for, substituting toast-water, rice, or barley-water instead—gave the stomach rest by slight refections of arrowroot or corn food; and where abdominal tenderness remained, a succession of warm poultices afforded the necessary relief.

The principle of treating diarrhœa by neutralizing intestinal sulphuretted hydrogen by acetate of lead, backed by Dover's powder, I have every successive year come to regard with increasing confidence as equally sound and satisfactory.

As to the possible disadvantage of plumbism or lead-poisoning becoming superinduced by undue perseverance in such doses, I can call to mind only one case where slight hand-tremors and a blue line at the junction of the teeth and gums became apparent in the person of a thin debilitated elderly female, who had been subjected to repeated half-dozens of these powders for renewed diarrhœal attacks. Here a few doses of iodide of potassium put matters to rights, and I had no further complaint from this patient so long as she remained in the neighbourhood.

The sweetness of taste of the lead-salt, and the slight bitterness of the pulv. Doverii, being so easily masked by the modicum of sugar and water, in which the medicine is naturally directed to be administered, constitute a recommendation not altogether to be despised. There is sound sense as well as melody in the lines of the epic poet[1] when he refers to the custom of sweetening the edges of the vessel to the sick child, so that deceived he drinks the bitter draught and receives his life from the deception.

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[1] Tasso.—"Così all' egro fanciül porgiamo aspersi,
Di söave licòr gli orli del vaso,
Succhi amari ingannato intanto ci beve,
E dall' inganno suo vita riceve."
La Gerusalemme Liberata, canto primo, v. 3.

ARTICLE IX.—*On the Occasional Arrestive and Discutient Influence of Pregnancy over Pelvi-abdominal Tumours.* By ALEXANDER MILNE, M.D.

(*Read before the Obstetrical Society of Edinburgh*, 13*th May* 1874.)

ALTHOUGH the operation of ovariotomy, once the most fatal, and the dread of surgeons, has now been rendered one of the safest in surgery, those less heroic means and measures, whereby arrestment and even cure are occasionally effected, should not be overlooked or ignored. There is doubtless a tendency to become oblivious of these, or to view them with something like contempt; partly owing to a scepticism as regards the utility of anything and everything short of the great operation (founded doubtless on frequent failures), and partly owing to the splendid success of that operation itself. Now, I do not mean to say that many cases of ovarian tumours are capable of cure by any means short of extirpation; still, I think there will be found, scattered through the pages of our journals from time to time, a goodly number of cases where a permanent cure was achieved without resort to the major operation. In some cases it is the bromide of potassium or the chlorate of potass that cures; in others, pressure or tapping, or both combined; or the happy result may be brought about by an accidental blow on the abdomen. Here is the report of a case of the latter kind; only, I regret to say, the blow was intentional. “Dr Bezencenet mentioned at a meeting of the Vaudian Medical Society the case of a woman suffering from ovarian dropsy who had been tapped several times. In a drunken fit, her husband kicked her, and ruptured the cyst. Slight peritonitis followed, the iquid was soon absorbed, and the tumour entirely and permanently isappeared.” You will find other cases of a similar kind in the ournals from time to time. In addition to these agencies, there is hat of Nature herself; in other words, a cure may come about pontaneously; that is to say, absorption may preponderate over cretion. We have had such cases reported at this Society; Dr itchie, for instance, detailed one; and although, if I remember ight, a cure was not effected, there was from time to time a great minution of fluid; in fact, there was an alternated rise and fall.

I have thought it necessary to say this much preliminarily, cause, as I before remarked, the cure of such tumours, apart om ovariotomy, is doubted by not a few; and, therefore, it might ewise happen that the cure by pregnancy might awaken equal pticism.

And now as regards the influence of pregnancy, which is the re immediate subject of my short paper, let me observe that I quite aware that I take up new ground when I venture to say t that influence may in some cases be curative. Ground that l be strongly contested too, doubtless, because the bulk of our authorities are agreed in ascribing a damaging power to the gravid state. Pregnancy, they nearly all forcibly affirm, not only accelerates the growth of these cysts, but excites inflammation, adhesions, and suppuration, which may be of a fatal character. So firmly is this belief held, that virgins in whom an ovarian tumour has been detected are recommended not to marry; and the married, in a similar plight, are recommended to abstain from sexual intercourse, or, at least, to keep clear of the most favourable periods for conception. Now, I do not mean to question the general soundness or correctness of a belief so widely held, endorsed, too, by so many men of eminence and mark; but having met with some cases where a cure was effected apparently by pregnancy alone, it has occurred to me that the commonly accepted doctrine has been formulated rather too stringently, and that some modification is demanded. This in the interest of unmarried females who may be betrothed, and in behalf of the married women who may not care to submit to the restraints of celibacy; this also in the interest of health, which is supreme; for, if it is found that pregnancy in many cases, so far from aggravating, ameliorates, then how uncalled-for and improper the veto upon marriage, and the embargo on sexual intercourse.

But I must now give notes of cases. I regret they are so few; others, however, may be able to supplement them.

CASE I.—Miss H. consulted me (June 1869) in regard to a difficulty in making water, which she said came on gradually, and got worse from day to day. I did not examine her locally, being a virgin, but prescribed a little tincture of hyoscyamus and camphor; telling her, however, if she should find herself no better in a day or two, to advise me again. In a day or two she cast up, saying that she was not only no better, but a great deal worse: there was, in fact, retention. I had now no hesitation in instituting an examination, and the proceeding was amply justified by the condition of things. I found an anteverted cervix pressing on the urethra, and that this displacement was brought about by a tumour. This occupied the right side of the utero-rectal fossa, and appeared to be about the size of an orange. It was somewhat elastic, and not painful to touch. It was quite mobile and could be elevated with ease. I immediately pushed back the cervix, and emptied the bladder with a long flexible catheter. Daily, for about a fortnight, catheterism was needed, but after this, owing to the ascent of the tumour into the abdomen, the bladder performed its functions readily. The case was diagnosed as a monocystic or unilocular ovarian tumour. This lady was engaged to be married, and I was consulted about the propriety and safety of it. I said that it was usually viewed as a bar to marriage, but that I had not had great personal experience in the matter. In December 1869, or about six months after I had detected the growth, the lady was married. Love, or policy, or caprice had triumphed over fear. I was aware of it, and apprehended evil. The anticipated evil, however, never came; at least, there was nothing exceedingly serious. In April I was called on to visit her, as she was suffering from sharp pains over the abdomen. In addition to this, I found her extremely prostrate, and rejecting all food. The pain was assuaged by opium, but the vomiting continued more or less for two days; after this it ceased. In the middle of September I delivered her of a healthy female child. Since then she has had two, a male and female, and the ovarian tumour has completely disappeared.

Case II.—Mrs A., aged 28, and the mother of three children, was in labour for the fourth time in August 1870. On examination I found the os rather rigid, and pressed up towards the pubes, by a large fluctuating tumour in Douglas's space. This I had little hesitation in concluding was ovarian. I was fortunately enabled to push it up above the pelvic brim, and in a couple of hours or so, a male child was born with ease. In April 1872, Mrs A. was again delivered of a son. On this occasion the tumour came down, but was evidently half the size, showing that diminution, not enlargement, had taken place. In February last, she gave birth to a female child, the tumour coming down again still further reduced, so much so as to require no interference.

Case III.—Mrs L., aged 42, and the mother of six children, sent for me in September 1871, complaining of severe pains like those of labour. She was nursing her sixth child, which was fourteen months old, and thought it hardly likely that she was in the family way. On examining per vaginam, I found the following: Cervix uteri slightly anteverted and turned to the right. In the recto-vaginal pouch, a rounded tumour of pretty firm consistence, and about the size of the closed fist, could easily be detected. It was quite mobile, and quickly gravitated after being pushed upwards. As the uterus was somewhat enlarged, and the woman believing herself to be in the family way, I did not employ the sound, but concluded that the enlargement was ovarian. Seven months after I was called on to deliver her. On arrival, I found the os fully expanded, and head presenting below the pelvic brim, but pushing before it an oblong elastic tumour. From its shape I was inclined to think it hernial, but on careful manipulation, I concluded that it was cystic. As it was evidently obstructing the descent of the head, I chloroformed the patient, pushed the head above the pelvic brim, and then elevated the tumour. It descended again, however, before the head, and I had to deliver by version. Twelve hours after delivery there was intense abdominal pain and other symptoms of peritonitis; but by means of the usual remedies and appliances these were satisfactorily met, and the woman recovered well. I have not been called since to attend her, and I conclude that the tumour had been discussed during labour. I should liked exceedingly to have made a commentary on the foregoing cases, but I have not found time to say all that I could have wished. Only let me observe, that it appears to me quite natural to expect that the pressure of an enlarged uterus may often discuss an ovarian tumour. Pressure is an old and effectual remedy in effusions, and wonderfully facilitates and accelerates absorption. In the case of an ovarian cyst, the pressure of an enlarged womb is, I think, fully more likely to promote absorption or disruption and subsequent absorption, than the external pressure by bandaging. Anyhow, the principle is the same.

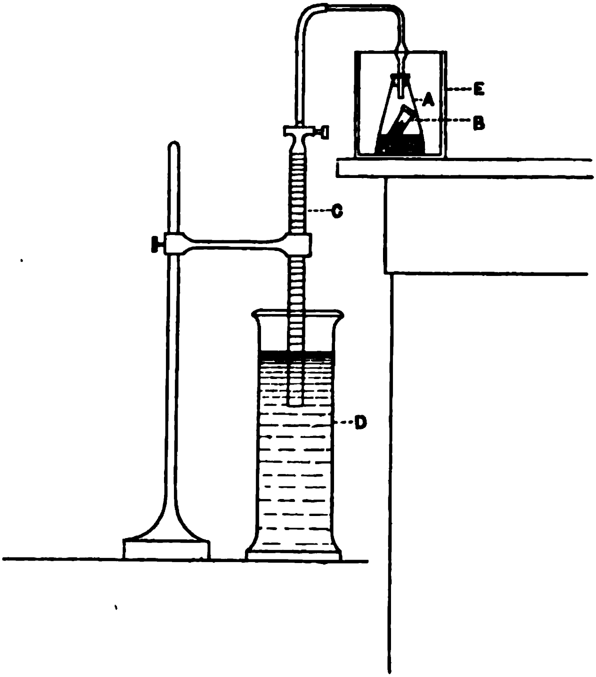
The cases I have reported are all, so far as I could make out, monocystic, and it is very probable that these are the cases most likely to be benefited by pressure. Doubtless, uniloculars soon become multiloculars; but doubtless, also, pressure helps to arrest proliferation.

It would not be right for me to omit saying a word or two on the possible risks. Pressure may promote inflammation and adhesion, and it may induce a bursting of the cyst with evil, nay fatal, results; still, from the experience of these three cases of unilocular ovarian tumour, I am more than ever inclined to think that pregnancy need not be the bugbear here that it has been represented. If, then, any Fellows have a maiden patient, both betrothed and the possessor of an unilocular ovarian, let them not say nay when asked if she may marry; on the contrary, and especially if the growth is small and pretty clearly a monocystic ovarian, let them sanction the step as a probable journey towards a perfect cure.

ARTICLE X.—*On a simple Apparatus for the Estimation of Urea by the Nitrogen Process.* By GRAHAM STEELL, M.B., late Resident Physician Royal Infirmary.

SINCE the introduction of hypobromite of soda for urea estimation, instead of hypochlorite of soda as originally used by Davy, the only difficulty in its general application to clinical observation has been the want of a simple apparatus. Having had occasion lately to make a considerable number of urea determinations both by the volumetric mercury and nitrogen methods, I found the following apparatus of so much value that I venture to make a note of it, in the hope that it may prove useful to those who are engaged in the daily examination of a series of urines, and to whom rapidity of performance, combined with accuracy in the process employed, is of the utmost importance.

The hypobromite of soda solution is readily prepared by slowly adding about 300 grammes of bromine to a pound of caustic soda, dissolved in a litre of water, care being taken to moderate the amount of heat produced. The apparatus consists of the following parts:—1. A small flask (A) of the shape represented in the diagram, containing when full 75 c.c., four inches in height, and nearly two inches in diameter at its base. It is fitted with an indiarubber stopper, through which passes a bent glass tube, having a small bulb upon it above its exit. To the end of this tube a piece of thick indiarubber tubing, of small bore, and about six inches in length, is attached. 2. The lower end of an ordinary test tube (B), of such a calibre as to pass easily within the neck of the flask, about two inches and a half long, and engraved with two marks, one for 5 c.c. the other for 3 c.c. 3. A glass-stoppered burette (C), with stand. 4. Two vessels to contain water for cooling purposes: the one a tall glass jar (D), nearly the height of the burette, to permit of the complete immersion of the latter in water; the other (E) of sufficient size for the immersion of the flask in a similar manner. A quantity of water which has been standing for some time in the apartment, and has therefore acquired its temperature, is the only other requisite. It will be seen from the above enumeration that the parts composing the apparatus are of the simplest kind, and are generally to be found in the laboratory of an hospital.



The procedure is as follows:—The jar (D) nearly full of water, along with the burette-stand, is placed upon a stool of convenient height; the burette is filled with water, inverted and so fixed by the arm of the stand that three or four inches of it only are immersed in water (this is to obviate undue pressure when the nitrogen is evolved). The vessel (E) is placed upon a table at a higher level, also nearly filled with water. About 30 c.c. of hypobromite solution are then poured into the flask. 3 or 5 c.c. of urine, according to its probable concentration, are measured in the test tube (B), which is then gently dropped into the flask (A), care being taken to avoid mixture of the fluids; the stopper is now inserted, and the flask plunged in water within the vessel (E). After the lapse of a minute or two, the indiarubber tube above mentioned is attached to the nozzle of the burette. The stopper of the latter is then opened, when a slight subsidence of the water in the burette takes place, but ceases immediately *if the apparatus is air-tight.* The flask is removed from the vessel (E) and gently inclined so as to mix the fluids within it, when the nitrogen is at once evolved, and collects in the upper part of the burette. Too rapid mixture ought to be avoided, as from the alkalinity of the hypobromite solution, froth is apt to be produced in abundunce and pass over with the nitrogen, thus diminishing the volume of the latter. The flask, after each successive mixture, is shaken in a rotatory manner, which greatly facilitates the escape of gas. When effervescence has apparently ceased, to insure complete mixture, the flask is inverted, care being taken while doing so to grasp the indiarubber tube tightly between the finger and thumb. Should no further evolution of gas follow, the action is at an end, and the flask is again placed in the vessel (E) to cool. After the flask has been immersed for a minute or two, the burette is depressed to the bottom of the jar (D), and again raised, so that the level of the water within and without it is the same. The flask still remaining in water, the stopper of the burette is shut, and the indiarubber tube detached. The volume of nitrogen has now only to be measured, the burette, while this is done, being raised so as to bring the water within and without it to the same level.

As all burettes have an ungraduated portion at their extremity, the capacity of this space must be ascertained, and the number of cubic centimetres which it contains added to the volume of nitrogen, as read by the figures engraved on the burette.

0·1 gramme of urea was found to give off 37·5 c.c. of nitrogen at a temperature of 63° Fahr., and a barometric pressure of 30 inches. When the barometric pressure was at 29·5 inches, the volume was increased to 38 c.c., but as half a cubic centimetre is such a small fraction of the total volume of nitrogen, the resulting error is unimportant. The volume of nitrogen obtained, divided by 37·5, will give in decigrammes the amount of urea in the quantity of urine taken for the experiment. This, again, multiplied by the total amount of urine passed in twenty-four hours, divided by the number of c.c. of urine used for the experiment, will give the quantity of urea excreted in twenty-four hours. Thus, 36 c.c. of nitrogen being obtained from 5 c.c. of urine, and the total quantity of urine passed in twenty-four hours 1400 c.c., 0·96 decigramme is contained in 5 c.c. of urine, $\frac{36}{37 \cdot 5} = 0 \cdot 96$; and the total amount of urea excreted in twenty-four hours is 268·80 decigrammes, or 26·880 grammes, $0 \cdot 96 \times \frac{1400}{5} = 268 \cdot 80$. If an answer in grains is desired, the grammes have only to be multiplied by 15·5.

I may mention here the differences in the results obtained by the two processes—the mercury and the nitrogen; usually the result by the former exceeds slightly that by the latter, as seen in the following examples :—

	By Nitrogen.	By Mercury.
(1.)	18·360 grammes	18·630 grammes
(2.)	15·8608	16·3850
(3.)	26·598	27·075

In all these experiments well-marked yellow coloration with carbonate of soda was taken as the end reaction.

Other nitrogenous bodies, present in small quantities in urine, give off their nitrogen also, thus :—Hippuric acid, 0·5 gramme, gave off 34 c.c., and creatine, 0·3 gramme, 43·5 c.c., nearly their total nitrogen ; while uric acid gave off only about one half of its nitrogen.

To expedite the process, it is well to have two apparatus at work at the same time.

When we consider the many difficulties involved in the mercury process, such as the making of accurate standard solutions, the time employed in filtering urine and cleansing beakers, etc., the corrections for chlorides, concentration or dilution, not to speak of the uncertainty of ascertaining the first yellow reaction, when both solution and precipitate are tinged yellowish from first to last, as occurs when excess of pigment is present in the urine, we can have but little doubt that the process by nitrogen will soon supersede it, and, moreover, will tend to increase the number of investigations as to the influence exerted by many diseases, both febrile and non-ebrile, upon the important physiological function of urea elimina-ion.

The apparatus may be seen at Mr Gardner's, 45 South Bridge.

Part Second.

REVIEWS.

Third Annual Report of the Board of Health of New York. Pp. 349. New York: 1873.

In every respect our Transatlantic cousins are proverbially go-ahead, and the last Annual Report issued by the Board of Health of New York shows that, as regards sanitary matters, they are acting most energetically to lower the death-rate of the principal city of the Union. It is but yesterday that London, the metropolis of the world, provided itself with a corps of medical officers of health; but in 1872 we find that the medical sanitary staff of New York consisted of 1 city sanitary inspector, 10 health inspectors, and 12 assistant health inspectors; and in addition there was a vaccination corps of 49 physicians engaged in the active duty of house-to-house vaccination. This last assistance was imperatively demanded by the continuance of an epidemic of smallpox. In 1872, 929 fatal cases of the disease were registered—its greatest annual mortality in New York; and from 1st April 1872 to 1st April 1873, 1575 cases were reported to the sanitary bureau. The discovery of such cases was followed by suitable measures to ensure isolation of the sick, their removal to hospitals, the disinfection of clothes and apartments, and the vaccination of parties in contact with the sick and living in the neighbourhoods. "By steady and persistent effort in this direction, the epidemic has been controlled, and doubtless many lives have been saved. *Indeed, it is seldom that a second case has occurred in any house where the first case was reported sufficiently early to secure timely vaccination to the rest of the inmates;* but so great has been the dread of removal on the part of many that cases have sometimes been concealed, until a fatal termination or the prospect of death caused them to be reported to this bureau. Every such case has, I think, without exception, been followed by a succession of others in the immediate vicinity." Nothing can be more satisfactory than the evidence thus afforded of the protective influence of vaccination, and also of the powerful means we have in this simple remedy of stamping out a most loathsome disease.

But while epidemics of smallpox and cholera arouse the attention of a community and lead to great sanitary exertions, we are too apt to forget that other and equally destructive diseases are allowed to pass unnoticed without any endeavour being made to check their progress. The late Sir J. Y. Simpson, in a memorable pamphlet, drew the attention of the profession to the importance of stamping out scarlatina, measles, etc. But as yet little heed has been given

to his suggestions. The apathy of the profession and of the public is something surprising, when we reflect on the large mortality caused by these diseases. In New York, while smallpox destroyed its 929, and had 49 special medical men told off to watch it, scarlatina killed no fewer than 990, and apparently no one but the city statistician paid any attention to the alarming fact. Of these deaths, 918 occurred in children less than 10 years old. The oldest victim was between 40 and 45 years. When shall we have hospitals large enough to admit the cases of these infectious disorders? Until these are provided, compulsory removal dare not be attempted; and it is idle to talk of isolation in the overcrowded houses of our poorer populations. We commend the subject of the prompt and successful treatment of the exanthemata as one of the most important subjects that can engage the attention of our now numerous medical officers of health.

No wonder that, with such items in the bills of mortality, the death-rate of New York, estimating the population at one million, was equal to 32·6 per 1000. The city appears to be subdivided into 22 sanitary districts, and, as might have been expected, their respective rates of mortality vary remarkably. The lowest rate —viz., 19·2 per 1000—prevailed in the 15th district. The highest mortality was reached in the 6th district, where nearly 40 per 1000 were cut off during the year. The death-rate of the 1st district was equal to 38. "These two wards, as usual, continued to exhibit pre-eminently the results of overcrowding, local insalubrity, poverty, and vice." It is only by thus dissecting the mortality of a large town that its plague-spots are laid bare, and citizens are roused to see the necessity of intelligent sanitary effort. Were we to regard the death-rate of London, and trust to its information alone, it might appear a waste of words to insist on the appointment of an expensive sanitary machinery in every parish; but when the metropolis is subdivided into sections and their mortality carefully tabulated, these local death-rates become sufficiently alarming to convince us that the total death-rate of London, as given weekly, is a species of sham, and is calculated to mislead the superficial observer. We could have wished, in this otherwise comprehensive Report, that the diseases of the special wards or sanitary inspection districts had been tabulated so as to permit of thorough comparison.

Of the quarters of the year, that of summer was remarkably high. Although smallpox, scarlatina, and other zymotics declined in severity, 10,025 deaths occurred, being 2192 more than in the corresponding quarter of 1871; 2063 more than during the previous 5 years, and 238 more than in the summer quarter of any previous year, the next most fatal having been that of 1866, when Asiatic cholera was present. It is very interesting to observe how satisfactorily this immense mortality is accounted for.

"It was unquestionably due in a large degree to the excessive heat of July, whose mean temperature rose 3½° above that of the corresponding month for 10 previous years; but the fact that an uncommonly high death-rate had prevailed during the entire winter and spring of the year, rendered almost inevitable a proportionate excess of mortality in the hot season. The greatest death-rate of the year was at once attained in the very beginning of the quarter. From 807 deaths, in the week ending 29th June, the mortality rose suddenly in the ensuing week to the enormous figure of 1591, over 200 deaths more than had ever before been reported for any single week." Although an excessive fatality in summer, as compared with the rest of the year, is periodical in New York, the unwonted period of its occurrence in 1872 was peculiarly striking. The maximum mortality of the year had never previously been recorded so early in the season. It will suffice to go back as far as 1835 in corroboration of this fact. From that time, during ten successive years, the greatest weekly number of deaths was never attained until the *third* week in July; in one year (1857) it was delayed until September; and in six out of the ten years, until August. Since 1864 (when during four consecutive years it had occurred in August) the point of maximum mortality has been retrogressive. In 1865, 1866, and 1870, it was noticed in the third week of July; in 1867 alone, in the fourth week of July; in 1868, 1869, and 1871, in the second week of July; and finally, in 1872, in the first week of July. Both the mean temperature and humidity of the last-mentioned week were exceptionally high, the former being 9° more than for the corresponding week during the previous ten years, and the latter being 75 (saturation being represented by 100). We thus had illustrated the deadly influence of a very elevated temperature, associated with a moisture-loaded atmosphere, whose concurrence at an unusually early period occasioned the extraordinary mortality of this week. Throughout the entire category of diseases there was a general increase in which all ages participated, but which was more manifest among the very young and the aged—733 children under 1 year, and 43 persons of 70 and upward, having died during the week. Of the 733 infants, 495 perished from diarrhœal complaints; 212 persons succumbed to the direct effect of solar heat; 172 were cases of true insolation, of whom 75 expired within 6 hours of the seizure, 106 within 12 hours, and 125 within 24 hours. The greatest number of deaths from solar heat (68) took place on 2d July, on which day was recorded the maximum temperature of the week in both sun and shade, viz., 128° and 97°, as well as the greatest degree of humidity, viz., 84. Of the sunstrokes on this day, 40 proved fatal within 8 hours. The majority of such accidents affected people between adolescence and middle age. Children and old people were the principal sufferers from exhaustion by atmospheric temperature. Thirty-nine of the sunstrokes during this week were certified as being cases of habitual intemperance."

The greatest sanitary evil in New York appears to be overcrowding, the wretched condition of the tenements inhabited by the poor, and the system that prevails of storing up filth in privies and middens. According to Dr Nagle, the Registrar of Records, or principal statistician, overcrowding "may be mitigated, but can never be removed. The configuration of Manhattan Island has determined a certain disposition of its population, which must be accepted as, to a great extent, established; and, in the case of the poorer classes, deficiency of ground-space has of necessity found a compensation in lofty dwellings, comprising a vast assemblage of small domiciles rising one above the other. These houses, although of recent years immensely improved in sanitary condition through the unceasing exertions of the Board of Health, must always (!) continue to swarm with human life, and to contribute an undue quota to human mortality." This description might stand for a graphic account of the Old Town of Edinburgh—a city, however, where the doctrine that overcrowding can never be removed, obtains no credence. The comparatively poor municipality of the Modern Athens has set itself earnestly to pull down the worst portions of the Old Town, and by cutting wide streets through the most densely crowded localities, to let in air and light. We doubt not that similar measures are applicable to Manhattan, and we are sure that no other remedies will be of the slightest avail to diminish the overcrowding and consequent mortality.

With regard to insanitary dwellings, the powers of the New York authorities appear to be limited. "At present, the power of the Board to vacate a dwelling appears (*sic*) to be limited to such structures as are, by reason of their dilapidated condition, dangerous to the lives of their inmates, or else, by reason of the presence of a pestilence, the public health is seriously imperilled; whereas there are many dwellings where neither of these conditions is present, and yet the sanitary condition is such as to render them unfit for human habitation, causing the inmates to suffer from general cachexia, and a long train of evils that cannot be classed under the head of pestilential or contagious diseases." In this country the comprehensive term nuisance would include such cases, and they could be summarily remedied.

The disposal of the town refuse is, as usual, the great problem. Nothing can be worse than the system that prevails in New York —open privies and middens. Attempts are made to ventilate these by means of shafts. "Sewer-connexions with privy vaults, though in theory advisable and generally serviceable, are nevertheless, by improper construction and want of care, often a source of annoyance, defeating the object they are intended to accomplish." We are equally certain that the remedy proposed —viz., the dry-earth system—will, in the tall overcrowded tenements of New York, be found equally faulty, even although, as is proposed, that coal-ashes be used as a substitute for the earth. The pan-and-pail method, with daily removal, as recommended by the Board of Health of Massachusetts, and long employed here with success, is, in our opinion, the only system that will give satisfaction.

This, the third Annual Report, contains in addition most interesting statistics as to the chief causes of death during the year, and also notices of a great variety of sanitary topics, from wood pavement—which is condemned as not durable, and becoming saturated with filth—to cushions at the back of the seats of tramway and other cars. These cushions are peremptorily ordered to be removed. No special reason is assigned. An account of an epidemic of influenza among the horses in the State is appended.

The Student's Guide to Surgical Anatomy: Being a Description of the most important Surgical Regions of the Human Body, and intended as an Introduction to Operative Surgery. By EDWARD BELLAMY, F.R.C.S., Assistant-Surgeon to Charing-Cross Hospital, etc. With fifty Woodcuts. Pp. 298. London: J. and A. Churchill: 1873.

To invest the dry and often wearisome details of regional anatomy with life and interest, we must either endeavour to bring out the morphology and teleology of the different parts, by showing the part they fulfil and the ends they serve in the animal, the species, or the race. Or, on the other hand, especially in human anatomy, we may show the value of such knowledge in practice, and how anatomy bears on surgery or medicine. For the latter purpose, to apply anatomy to surgery, this little book has been written. The author is trying to expound the ideas of surgical anatomy, which give life and interest to the anatomical works of Heath and Holden, and to follow in the wake of Professor Roser, whose work, translated by Mr Galton, has similar aims. On the whole, we think Mr Bellamy has succeeded in his attempt, though here and there inaccuracies or omissions might be picked out by a severe critic.

At p. 27, Mr Bellamy describes the passing of a probe through the punctum into the lachrymal duct, in a manner possible, certainly, *after* the punctum has been slit up; but we suspect impossible, in the living body at least, *before* that has been done.

The following point about the relation of the sterno-mastoid to the carotid, is an important one:—"In most works on descriptive anatomy, it is not sufficiently enforced that this muscle completely covers in the common, internal, and external carotids; and that while the muscle, its integuments, and the fascial coverings are intact, it may surgically be considered to extend forwards as far as the angle of the jaw. Its pulsations are in reality felt beneath its own border, or immediately beneath its sternal and clavicular attachments. According to Richet, it is impossible to puncture the common carotid from the side of the neck without perforating the sternomastoid in the undissected subject,—a statement I have taken care to verify."—P. 71.

To tie the carotid above the omohyoid, an incision, three inches in length, from angle of jaw to cricoid cartilage, is recommended, p. 79. The centre of such an incision would fall *above* the bifurcation.

The descriptions of amputation are often too indistinct and not precise enough for students; as, for instance, "amputation at the wrist-joint may be performed either by a semilunar dorsal flap, and an anterior formed from the palm, or by rectangular flaps. The styloid processes of the radius and ulna require removal, and the vessels which would be ligatured are the superficialis volæ, some branches of the ulnar in palm, and perhaps an abnormal median." —P. 154. *Why not the radial?*

The following is a specimen of the kind of description given by the author of the surface-markings as guides to appreciation of surgical injuries. It makes rather hard reading for a student:— "If the exact relations of the great trochanter with the several osseous prominences observable on the pelvis in a normal state be examined, it will be noticed that if the femur be flexed at a right angle, and at the same time slightly adducted, the apex of the great trochanter corresponds with a line drawn from the anterior superior iliac spine to the tuberosity of the ischium, and that this line divides the cotyloid cavity (which, with respect to the surface, may be regarded as occupying the central position between the anterior superior spine of the ilium, the spine of the pubis, and the tuberosity of the ischium) into two equal parts. This line, corresponding to the centre of the cavity, will serve as a guide to an appreciation of the extent of displacement in dislocation. Thus, supposing the head of the femur be placed behind the cotyloid cavity, this line, instead of corresponding with the apex of the trochanter major, would correspond with a point nearer its base. The extent of the displacement, then, will be measured by the prominence of the great trochanter behind this line."—P. 226.

The following statements so exaggerate the real differences as to require revision:—"The neck of the femur varies, as regards its obliquity to the shaft, with the age of the individual. Before puberty it is very oblique, and almost in a continuous axis with the shaft. In the adult male it is at an obtuse angle with it, and directed upwards, inwards, and forwards, whilst in old persons it becomes horizontal."—P. 237.

The accounts of the collateral circulation by which the ligature of great vessels is compensated, are good, full, and accurate. The work seems one with good intention, and in a good line, and by some slight changes and additions the execution of it might be much improved.

Some of the woodcuts are drawn very nicely by the author; the others, when borrowed, are frankly acknowledged. We wish it every success.

Autobiographical Recollections of the Medical Profession. By J. F. CLARKE, M.R.C.S., etc.; for many years on the Editorial Staff of the *Lancet.* P. 537. London: J. and A. Churchill: 1874.

WE have no hesitation in saying that this is a good book, and well worthy of perusal by all who desire to understand the changes which have come over the profession during the last forty years. These changes have, we believe, been advantageous in most instances; but while tracing, under Mr Clarke's guidance, the onward march of salutary reform, we cannot but agree with him that, in not a few particulars, there is some room for the criticisms of those who are constitutionally *laudatores temporis acti.*

The author has enjoyed very special advantages in his early and long-continued connexion with the periodical press, and from his intimacy, thereby formed, with most of the men who gained a distinguished place as contributors of original articles, as teachers in the London schools of medicine, and as professed reformers of time-honoured abuses. He is still actively engaged in practice, but has found time to review the scenes, many of them of great interest, which he witnessed long years ago; and in the course of his narrative, which is pleasantly discursive, he presents us with spirited pen-and-ink sketches of departed friends and associates, making his pages very inviting to those readers especially who, like himself, have reached the age of threescore years. We happen to have known or seen not a few of the individuals thus portrayed, and their likenesses are in the main so successful that we are disposed to give Mr Clarke equal credit for those of others with whom we were unacquainted. Perhaps there is a slight tendency to exaggerate or caricature; to consider some men as more remarkable than they really were, and to under-estimate others who have been generally held in high esteem. But this, from its giving point and piquancy, is a temptation not easily resisted.

The following remarks on "Specialism" are very just, and deserving of attention:—"There can be no doubt, I think, that at this period (1828), the relations between the public and the family doctor were, as a rule, more cordial and more binding than they are at the present time; that the rules of etiquette betwixt doctor and patient were more rigidly observed; and that changing the ordinary medical attendant was less frequent than it is now. If the 'general practitioner' was less skilled in his profession and generally worse educated than at the present time, it is certain the confidence reposed in him was great, and he was the family friend. I do not intend to insinuate that this is not the case now in a vast number of instances; but I am sure the older practitioners will bear me out in my statement, that our hold of our patients at the present day is less firm and satisfactory than it was forty years since. In one word, the profession was held in more respect by the public at that time than it is now. The relations of the surgeon-apothecary with the consulting practitioner were far more satisfactory. . . . I am sure there was more of the true *esprit de corps* than there is at present. Moreover, we were free from the vice of specialism,—a system which has done more to injure the great body of the profession than all the quackery and 'pathies' in existence. It has foisted on the public a belief that the well-informed physician or surgeon, trained in every department of his profession, can do less for a local complaint than he who has devoted himself specially to the affected organ—as if the man who merely understood the mainspring or the lever were a better watchmaker than he who was well acquainted with the entire mechanism."

Here are some excellent observations on the professional literature of the present day, as contrasted with that of half a century ago:—"The great evil of the present day, *quoad* the writers and authors of the profession, is the voluminous nature of their contributions. This is an evil which seems on the increase. Voluminous writers should remember that their lucubrations are read in an inverse ratio to their length. Facts can be stated briefly; the briefer, so long as they are clear, the better. Take a volume of the '*Transactions of the Medico-Chirurgical Society*' fifty years since, and compare it with one of modern date. The difference is striking, but not pleasant to us. Yet who shall say the late volumes are to be compared in interest and value to the earlier ones? When Astley Cooper, Haighton, and Babington were at Guy's; Green, Tyrrell, and Travers at St Thomas's; Abernethy, Lawrence, and Stanley at St Bartholomew's; Brodie, Keate, and Chambers at St George's; Charles Bell at the Middlesex; White, Lynn, and Guthrie at the Westminster; Blizard and Heaviside at the London, most of whom contributed to the Transactions, we had none of the windy reports that characterize those of the present day. The evil had begun to exhibit itself in the time of Sir Astley; who once naïvely remarked to me, 'Sir, the writers are becoming like seamen who neglect the prominent landmarks for taking useless soundings and making absurd calculations of no use to any one, and liable to run the unlucky ship on a rock.'"

The sketch of Mr Charles Aston Key of Guy's Hospital is a fair specimen of Mr Clarke's turn for portraiture:—"He was less brilliant—or perhaps showy—as an operator than Sir Astley Cooper, less learned and accomplished than Green, and less philosophical than Travers; but he was superior to Sir Astley in accuracy of diagnosis and in the higher principles of surgery. He was a far better operator than either Green or Tyrrell; and, although he had not that originality of thought which belonged to the author of 'Constitutional Irritation,' yet in all that constitutes a first-class practical surgeon he was the superior of Travers. His operations were the most neat and finished—no flourish, no demonstration; if one could coin a phrase with propriety, they might be called the 'poetry of surgery.' I know but one man among his contemporaries who came at all near him in this respect; this was Robert Keate in his palmy days. But Keate was inferior to Key in those higher elements of mind which are necessary to the formation of a great surgeon. It is to be regretted that neither of these remarkable men have given anything of importance to the literature of surgery. Key's appearance and manner were much in his favour. He had a handsome, intellectual face, denoting great perceptive and great reflective powers, and an eye of extraordinary intelligence. His manner was finished without being finical, and affable without being familiar. He was, if anything, too cold and unemotional; but the calm power he displayed at the bedside was striking, and gave instant confidence to the patient and his friends. He was somewhat above the middle height, of a graceful figure and carriage, and dressed in the full dress of the time—a blue coat with bright buttons, and black continuations."

To another hospital surgeon of eminence, John Painter Vincent, we think Mr Clarke does scanty justice. Having known him intimately at St Bartholomew's as his dresser and ultimately his house-surgeon, we formed a high estimate of the place which he was entitled to occupy among his contemporaries. With the exception of one or two cases in the Medico-Chirurgical Transactions, he published nothing, and he never appeared as a lecturer, so far as we know; but as a sagacious, sound, and experienced practical surgeon, he had few if any superiors. His colleagues at that time were William Lawrence and Henry Earle, both men of high reputation. The former, having transcendent ability, might have distinguished himself in any profession, and was the author, as we all know, of several admirable works in surgery and natural science; the latter was a good surgeon, although somewhat fussy and finical; but we never thought that either of these men possessed the inborn sagacity and natural aptitude for the profession which characterized Mr Vincent, or "Old Vinco," the term of endearment which the students gave him in those bygone days. His diagnostic powers were never at fault, resembling in this respect the great Edinburgh surgeon, James Syme, whom we lost in 1870. He was very dexterous in the use of the bougie in cases of very narrow stricture; and although he generally employed them made of catgut,—dangerous weapons in the hand of a novice,—he never seemed to injure the urethra. Being, as our author remarks, a peculiarly shy man, Mr Vincent required to be known in order to be adequately valued; but his manner to the poor was kindly and sympathetic, and few men performed their public duties at the hospital with so much quiet, conscientious regularity. John Abernethy, his old master, was right when he styled him the "Indefatigable Mr Vincent."

There was another London surgeon whose name does not appear at all in Mr Clarke's interesting book, of whom we desire to say a few kind and respectful words before closing this short review. We are thinking of Mr Thomas Blizard of the London Hospital, the nephew of Sir William Blizard, but thirty years his junior, and much his superior as a surgeon. Born in 1771, Mr Blizard was three years younger than his great competitor Sir Astley Cooper; and for many years they seemed to advance *pari passu* in public estimation. So early, however, as 1817, Mr Blizard, who was singularly tender and unselfish in his nature, felt constrained to abandon all his professional prospects and to retire into the country, in consequence of his wife's delicate health and her inability to live in London. At this time his professional income was £10,000; and he had already secured a handsome competency. He continued to the last to take much interest in everything connected with surgery, and was often consulted in difficult circumstances by professional brethren in the neighbourhood of his residence. This was the case, we know, at Brighton, where he lived for many years. He died in 1838 at the age of 67, twenty-one years after his retirement. Having told him of the uniform skill displayed by a former pupil of his own, Robert Liston, then on the eve of leaving Edinburgh for London, in relieving the bladder in cases of enlarged prostate, he said: "Do you know, Squire, who taught him that? He got the hint from me. They used to call me in to all the difficult cases at the London Hospital, and I never failed. If the instrument wouldn't go by the natural passage, I remembered the anatomy, and pushed it onward right through the middle lobe of the prostate." Mr Blizard was a neatly-made man, considerably below the middle height; with a very bright eye, a good forehead, and the eyebrows well developed. There was something very winning in his expression; and the tones of his voice were always hopeful and reassuring. His manner was full of tenderness and consideration when the occasion demanded these sentiments; and everything about him was natural and spontaneous.

The beaked knife for lithotomy, which is still employed by not a few surgeons, was invented by Mr Blizard. The late Mr Edward Stanley of St Bartholomew's, who resembled him a little in his outward man, was his nephew.

We conclude with an anecdote of the late Mr Pennington, a well-known surgeon-apothecary, as related by himself to Mr Clarke, at a very advanced period of his life:—"He and Abernethy were dressers at the same time to the celebrated Percival Pott, and each claimed precedence. Pennington was certain that he was entitled to be first, but for some time, in order to avoid a quarrel, gave way to Abernethy. On one occasion, however, Johnny carried his presumption a little too far. Pott was crossing the quadrangle followed by the students. He was giving a kind of running 'clinique' on a case in which Pennington was deeply interested, and, anxious to hear all that was said, he stuck close to the teacher. Abernethy came up and absolutely elbowed me out of my position. I then found that it was time to put a stop to his impertinence, particularly as the insult was given in the presence of so many of our fellows. I took no notice of it at the moment, though the circumstance did not escape the observation of Mr Pott. Immediately on the conclusion of 'the round,' I made up my mind to act, and accordingly, in the presence of a number of students, I addressed Abernethy—'Jack, this won't do; I have given way to you too long, and for the future you must be content to play second fiddle.' Abernethy began to bluster, and used strong language. At that time disputes of the kind were settled in a summary way, and I immediately prepared to assert my right by an appeal to the fist. The place of combat was in the corner of the ground which is near to the Anatomical Theatre, and thither we repaired, followed by our anxious and admiring *confrères.* I took off my coat and prepared for action. Jack did not follow suit. In fact, he declined the ordeal of battle, and I was for the future first. We were closely associated for nearly fifty years afterwards, but we never had an angry word. Dining with him some forty years after, in Bedford Row, the old quarrel between us accidentally cropped up. 'Well,' said Abernethy, 'the truth of the case was this—the moment I saw you uncover your biceps, I was certain I should be thrashed, and so, my boy, I surrendered at discretion.' "

The Birds of Shetland. By the late HENRY L. SAXBY, M.D.; edited by his brother STEPHEN H. SAXBY, M.A. Edinburgh: Maclachlan and Stewart.

THIS book contains the observations of one who, during a prolonged residence in the Shetland Isles, devoted such time as could be spared from the practice of his profession to the study of ornithology. To this, indeed, he devoted his energies; and those who had the pleasure of the personal acquaintance of the author, can readily imagine the zeal with which this study would be pursued. A naturalist born, the dull routine of medical practice presented few attractions for him; and at no time did he feel more at home than when following after some rare and little-known visitant of the Shetland Isles, or in transferring it to paper by means of water-colours, of which he was a consummate master.

Written by an author such as we have sketched, the book is what we would expect—a record of unwearied observations regarding the nature and habits of the birds of Shetland, told in a manner so that the most popular of readers can enjoy it: at the same time that there is no sacrifice of scientific accuracy. Here and there, the pages are enlivened by pithy remarks, such as all who were well acquainted with the author know how well he could from time to time indulge in. The subscribers must miss the illustrations of the birds, which would have materially enhanced the value of the book, drawn as they would have been by a draughtsman of great power; but the views which are given of different portions of the rocky scenery of Shetland, show well what the work would have been, had the author lived to complete it.

On looking over the book, we can distinguish at least six species (and there may be more) which, so far as we are aware, have been added to the fauna of Shetland for the first time. Among other observations, we remark a chapter of great interest on the Nesting of the Red Phalarope, not previously known to breed in Shetland; and farther on, one on the habits of the Pallas Sand Grouse, which, having appeared but once in the British Isles in 1863, came at the same time under the notice of Dr Saxby in the Island of Unst.

Dr Saxby's remarks regarding the specific distinction of the Iceland and Greenland Falcons, as also between the Common and Ringed Guillemots, are valuable, and will be read with much interest by naturalists, tending, as they do, to set at rest questions which have been differently answered by various ornithologists.

Enough, we trust, has been said to show that the "Birds of Shetland" is a book which no British ornithologist can be without; whilst the beauty of its illustrations will make it attractive to those who have no great interest in the study of ornithology itself.

The work of editing has been skilfully performed by Mr Saxby, the author's brother; and to him we are indebted for a complete list, toward the end of the work, of the birds which have up to this time been observed in the Shetland Isles.

The Simple Non-Mercurial Treatment of Syphilis. By RICHARD SAMUEL SISSON, M.D. London: H. K. Lewis.

On the Relative Frequency and Value of certain Symptoms of Congenital Sores. By W. BATHURST WOODMAN, M.D. Reprinted from the Transactions of the St Andrews Medical Graduates' Association. London.

THE former of these pamphlets is written to oppose the statements of some writers that syphilis is better treated without mercurials. Dr Sisson very cleverly and neatly proves what ought not to require a word more than has been already said by the vast majority of authorities on the subject. The writer's main object seems to be to point out that even the anti-mercurialists do not entirely dispense with the valuable services of that metal. There is no doubt that though the cry raised against mercury in syphilis has not influenced the profession much, yet it has had some effect on the public, and that to the great annoyance of practitioners and the injury of their patients, who sometimes refuse to take even the smallest dose of mercury. Anything, therefore, that strengthens our hands and increases our knowledge as to the legitimate use of mercury in syphilis is thankfully received.

The subject in connexion with which the other pamphlet is written is one of great interest. We have had our attention lately directed to the fact, that the literature of stricture is vast and daily increasing. Syphilis no less attracts attention at present, and deservedly. There is perhaps no disease about which our knowledge has increased more of late, and the branch of the subject which we have brought before us by Dr Woodman is not the least interesting.

In writing on congenital syphilis, he naturally refers to the question of infection by venereal sores, and whilst believing in the duality of sores as a general rule, tries to prove that there is a middle or modified sore which produces a modified form of constitutional syphilis, as pointed out by Dr Morgan of Dublin. And he would have us believe that the unicists and dualists, who have been fiercely fighting for so long, have here got a common ground, not for debate, but for agreement. There is no doubt that, like many other disputants, these two divisions of syphilographers are all the while agreed on the main practical points; but whether they will agree upon the modified sore, is quite another question. Dr Woodman has got a great array of authority to produce, more especially from military medical men. But we all know that what has been over and over again thought positively proved in the pathology of many diseases, and more especially in syphilis, has given way before more extended observation. That there is a third middle form of syphilitic sore is no new theory, but the recent researches of observers have never touched the great facts that there are two forms of venereal ulcer, the one producing constitutional syphilis, the other not. There is also another fact which has become evident (more especially of late, for a very good reason), that occasionally a sore, and the consequent constitutional manifestation, may be so influenced by early treatment that many of the ordinary graver characteristics do not appear. We also believe that the natural constitution and also the habits of a patient materially influence the character and virulence of the disease. A man who is in robust health and not given to dissipated habits will likely suffer less from, and sooner get over, the effects of an attack of syphilis.

Dr Woodman's object in writing is to answer a challenge from Dr Ballard to prove that there is such a thing as congenital or inherited syphilis. He does this by recording his observation of 200 cases which were under his care in the North-Eastern Hospital for Children. What he desires to prove is, that in children whose parents have been syphilitic, you find certain symptoms developing themselves, which symptoms or conditions are not present in other children in the same form, or with the same frequency, and that these symptoms arise from a syphilitic taint.

In all but 4 or 5 of his 200 cases, Dr W. proves both parents affected with syphilis. He then describes the symptoms met with in the children—just what we have been accustomed to look upon as congenital syphilis. "Each child," he says, "of the two hundred came under my treatment for *at least three* of the different classes of affections." And then he concludes—not that one of these symptoms only—but that "the accumulation of such symptoms in one individual gives us the right to infer the previous disease." He then asks those who argue that what is called inherited syphilis is caused by dirt, bad food, etc., "Since thousands" of the children which came under his observation at the Hospital "have been exposed to dirt, to the exanthemata, and to other causes," why have they escaped, and the two hundred who are the children of syphilitic parents been affected?

We think he has certainly proved his case, though at the same time we wonder that it should have been necessary for him to do so. We cannot imagine any medical man who keeps his eyes open failing to observe in the children of syphilitic parents (when they happen to have any) that sad spectacle of a child suffering for the sins of its parents, or more frequently for the sins of its father.

It is worthy of remark, though Dr W. does not specially refer to it, that it was not always possible to get a history of syphilis or evidence of syphilitic infection in *both* parents of the infected children. Some years ago it would have been thought impossible for a syphilitic child to have been born of a healthy mother. We are convinced, however, that we have seen this. And perhaps the occurrence of this somewhat remarkable circumstance explains why some doubt the existence of congenital syphilis altogether. We think also that it proves that the placental circulation is not so intimate between mother and child as we have been taught to consider it. It is a fact for those to digest who have to deal with laws regarding the suppression of this disease, that the man is almost always the originator of that disease for the supposed prevention of which women are legally punished. And we are strongly of opinion that if women who are suspected of being diseased are forcibly examined and placed under treatment when affected, men also (who might quite as easily be discovered *in flagrante crimine*) should be examined and obliged to place themselves under treatment, whilst such might be of real service in preventing the pollution of the innocent.

With regard to treatment, Dr Woodman does not say much, but we would infer from what he does say, that he employs mercury—without which, we believe, no case of inherited or acquired syphilis can be properly treated.

Clinical Aspects of Syphilitic Nervous Affections. By THOMAS BUZZARD, M.D., F.R.C.P., Physician to the National Hospital for the Paralysed and Epileptic. London: J. and A. Churchill: 1874.

THIS compact, practical little book, is a decided addition to the literature of syphilis. The first chapter, on Diagnosis, is particularly good. In the diagnosis of syphilitic nervous diseases, Dr Buzzard lays greater stress on the peculiar grouping of the lesions than on the individual symptoms. A typical case is given, showing the course and symptoms of a not unusual form of syphilitic nervous disease, from which the author deduces the following points of general diagnostic value, viz.:—"*1st.* The age of the patient. He was too young for the hemiplegia to be reasonably explained by the occurrence of non-inflammatory softening of the brain, such as is so common in advanced life from degeneration of the cerebral arteries, and the condition of his circulatory apparatus and kidneys was equally sufficient to exclude the probability of embolism, thrombosis, or cerebral hæmorrhage. The absence of unconsciousness at the time of his hemiplegic seizure, would also practically exclude the last. *2d.* The occurrence of lesion contemporaneously in two portions of the cerebro-spinal axis. This is a feature peculiarly noteworthy. It is exceedingly uncommon except as a result of syphilis, and very common in the disorders of the nervous system which are consequent on that disease. *3d.* The existence of marked cachexia, unexplained by evident disease of any of the viscera. *4th.* The history of a venereal sore, which had been contracted seven years previously, and which, as it was treated with mercury, and was followed by sore throat, was doubtless of true syphilitic character. *5th.* The immediate improvement and rapid restoration to health under the employment of iodide of potassium."

The second chapter is a statement of the modern views of the pathology of the subject, especially those of the Continental school. We do not quite agree with Dr Buzzard when he says that it is practically of little importance to discriminate whether the lesion due to syphilis occurs in the secondary or tertiary stage. Dr Buzzard has not seen any important lesions of the nervous system occur in the early stage of constitutional syphilis; but there is no doubt that severe nervous affections do sometimes occur in secondary syphilis, and as they differ pathologically from the lesions occurring in the tertiary stage, it is necessary, both as regards prognosis and successful treatment, to make a decided diagnosis.

There are thirty-seven illustrative cases of nervous disease dependent on syphilis. In most of the cases a clear history of syphilis is made out, and in no case is Dr Buzzard content with the slip-shod history of syphilitic infection which seems so often to satisfy physicians—as, for example, the admission by the patient that he has at some former time suffered from what he calls the "bad disorder," or the discovery of a cicatrix in the groin. Dr Buzzard adds his testimony to the modern opinion of the good effects in tertiary syphilis of large doses of iodide of potassium. We have perused this book with pleasure and profit, and can cordially recommend it.

Archives of Electrology and Neurology. Edited by GEORGE M. BEARD, A.M., M.D. New York: P. L. Clacher: May 1874.

Electrolysis in the Treatment of Stricture of the Urethra. By ROBERT NEWMAN, M.D. New York: 1874.

THE Americans have taken to electricity with their wonted enthusiasm. Two societies have been formed in New York for the special cultivation of "Electrology," and a journal is to appear half-yearly. We wish the Archives every success, and we consider its first number, on the whole, a creditable performance. We agree with the observation of the editor, that it would be rash to "expect the entire human race to rush to the office of the journal and enrol themselves as its subscribers;" but we think he may fairly hope to attract support sufficient to justify its continuance.

It presents to its readers, in addition to the usual foreign gleanings and criticisms, no less than sixteen original papers. These are by no means all of a high standard of excellence. In one of the critiques, we are told that in literature, "the American wants something that he can read while falling downstairs;" and it would almost seem that with some of the original essays, the "throes" of composition had been thus accomplished.

Several papers are, however, of considerable interest. Ferrier's researches are discussed by Dr Beard, who gives an account of observations in great measure confirmatory of Ferrier's views; and also by Professor Bartholow of Cincinnati, who has made some scarcely justifiable experiments on the human subject. Having as a patient a "passive, lymphatic, unexcitable creature," in whom epithelioma had destroyed both parietal bones, he passed electric currents through needles which he had inserted to various depths into her brain, and so produced, according to their situation and strength, unilateral movements, and even epileptiform seizures.

Dr Newman has a long paper—which we have also received as a pamphlet—on the treatment of stricture of the urethra by electrolysis. The experience already acquired on this subject has not been such as to establish its superiority over other methods. Dr Newman's cases (accurately tabulated, case 2164, 2220, and so on) show the possibility of destroying the stricture immmediately by electrolysis, but they are wanting in completeness, are accompanied by a long unscientific essay, and are only too successful in their results.

Dr Beard's advocacy of his method of "working up the base" of malignant tumours, to which on a former occasion we referred, fails to show any good reason for preferring it to the knife on the one hand, or the galvanic cautery on the other.

Dr Benedikt of Vienna contributes a short paper on cataleptiform hysteria; and papers on electricity in its application to other forms of hysteria are written by Professor Cabell of Virginia and Dr Hutchinson of Providence.

Dr Althaus records a tentative observation on the use of croton chloral as an anæsthetic for electrolytic operations on the face, and Dr Tripier of Paris recommends the faradic current as an anæsthetic in tooth-drawing.

The bill of fare is thus sufficiently varied, and a good deal of information on electrical subjects may be drawn from the various papers. The enthusiasm of the various hobby-riders is, of course, great, but the nature of the subject is likely to provoke it, and a germ of truth underlies the mass of crude material, which the Archives may possibly in the future enable us to expose more fully.

Les Climats de Montagnes considérés au Point de Vue Médical. Par le Docteur H. C. LOMBARD. Troisième édition, entièrement refondue. Geneva: 1873.

IN this book Dr Lombard deals with a subject not only interesting in a physiological point of view, but also worthy of attention from the direct practical results which seem likely to come from it. We are doubtful if the author can claim the honour to be the first to write a book on the subject. There was one in German, *Ennemoser über dem Klimat der Bergen;* but we never could get a sight of it. There are, however, so many separate books, articles, and statistics, which treat of the effects of residence at high elevations, that it is a formidable labour to collate them in order to generalize the results. Dr Lombard seems to live in Geneva, whence the head of the highest mountain in Europe can be seen crowned with "its diadem of snow." Much of the book has been written from his own personal observations, and from the conversation and letters of medical men living at different elevations amongst the great chain of the Alps. Dr Lombard has pondered over his facts in a truly scientific spirit, and has industriously studied the literature of the subject. He appears principally to have drawn his printed materials from French sources rather than from German ones—perhaps, because the French have done more on this subject.

The book is well arranged, and the information given in a clear and attractive form. Sometimes, forgetting the abstractions of science, he rises into enthusiasm at the thought of the grand aspects of nature presented by the beautiful mountains amongst which he lives.

When one ascends several feet above the level of the sea, the media in which he exists become changed. The temperature is lower; Dr Lombard calculates that, as a general rule, the thermometer sinks one degree Centigrade for every ascent of 166 mètres, but this cannot be stated as a result which holds good in all climates in the arithmetical ratio stated. Dr Lombard observes that we may compare a mountain to several degrees of latitude contracted into the short space of its height, every elevation of from 78 to 85 mètres corresponding, between the parallels of 38° to 71°, to a removal towards the north of one degree of latitude. The changes of the barometer can be stated in a more precise form. The pressure of the atmosphere upon the surface of the body and the lungs becomes less in proportion to the height attained.

At great elevations the air is drier; lightning is more frequent; but storms of wind are not so common. The only one of these changes which is peculiar to elevated regions, is the diminution of the pressure of the air. Dr Lombard gives a table of the weight of air supported by the human body at different elevations, from which it appears that the diminution of the pressure supported by the body of a man who went from Paris to Geneva would be about 800 kilogrammes; from Geneva to Mont Blanc, about 9700 kilogrammes.

The highest elevation reached by man is believed to have been attained by Mr Glaisher (not Glossher) in 1862, whose balloon mounted 9000 or 10,000 mètres. He and his companion very nearly lost their lives from the extreme cold and rarefaction of the air.

Barral and Bixio mounted in a balloon to the height of 7000 mètres, where the difference of weight of the air amounted to 9076 kilogrammes, but they found that they could breathe easily though they felt the great cold and a stiffness in the muscles. Labourers who work under the diving-bell can support a pressure thrice, and even four times, greater than the ordinary weight of the air, without any great inconvenience. It is thus clear that the human constitution has got considerable power of adapting itself to varieties of atmospheric pressure, and we must mount at least above 10,000 feet before we can find any marked immediate effects from mere elevation.

The author presents some careful calculations made by Professor Soret of Geneva, showing the gradual reduction in the quantity of oxygen at different elevations, from which it appears that the oxygen contained in a litre of air is reduced one half by an elevation of 5000 mètres, which is little more than the height of a post-house of Antomarca in Bolivia. M. Lombard shows that the insufficiency of oxygen is not by any means compensated by the increased number of respirations. The interesting observations in the Periscope of this Journal for July, p. 85, confirm and illustrate his studies on this point. As a result of the diminished pressure at great heights, the evaporation of fluids takes place more rapidly, and the serous membranes of the body are pressed less firmly against one another; the pulse increases in frequency, and the blood circulates more freely through the cutaneous surfaces. The author describes the *mal de montagne* as experienced in the high plateaux of Bolivia. The symptoms of this disease are, difficulty of respiration and derangements in digestion, a quick and strong pulse with burning skin and intense thirst, functional disorders of the nervous system, and a feeling of lassitude. The disorders of the nervous system and the organs of digestion disappear in a few days; but the feeling of weariness and of want of breath sometimes lasts for several months, sometimes for years, especially in people coming from the plains. It falls most severely upon stout persons, who are sometimes compelled to leave the high plateaux through fear of cerebral apoplexy. External hæmorrhage, emphysema, and anæmia, are also frequent. The inhabitants of mountainous regions are liable to take rheumatism and heart disease; but this may be owing to the frequent changes of temperature they undergo, while the tendency to aneurism is no doubt owing to the violent muscular efforts made in ascending the slopes.

The maladies which Dr Lombard thinks derive most benefit from a residence on high mountains are, functional diseases having for their symptoms want of appetite, anæmia, nervous debility, or excitement, as also diarrhœa and bronchial catarrh, and nervous asthma, goitre and cretinism; but rheumatism and organic diseases of the heart, arteries, and emphysema, are contraindicated.

The subject of the benefit to be expected from residence at great elevations by phthisical patients, is considered at length. The conclusion which Dr Lombard has come to after careful inquiry, confirms the views of those who recommend a prolonged residence at great elevations as a remedy for consumption, especially in its earlier stages. When the fever, nightly perspirations, and the local lesions indicate that the disease has passed into the third stage, Dr Lombard thinks that the case is no longer adapted to a mountain resort.

The author's researches strongly confirm the statements of Jourdanet, Guilbert, Weber, Tschudi, and others, that consumption is very rare or unknown on great mountain-heights.

The only serious defect of this book is the neglect of English sources of information. If it be considered that the British have for several generations stationed some of their troops on elevated places amongst the Himalayas, the Neilgherries, and other central

mountain-peaks in India, as well as in the Blue Mountains in Jamaica, and that they have been in the habit of sending invalids to these and other mountain sanitaria, such as Newera Elia in Ceylon, it will be easy to believe that the information gained by the medical officers of our armies is of such a diversified nature, and has been so well tested by experience, that it cannot be passed over in any book pretending to deal with the climate of mountains. We have often regretted that this valuable experience has never, as far as we know, been collected into one volume. It would require to be gathered from hundreds of articles in medical journals, pamphlets, and from books where it is incidentally treated; but it is clear that a man living in a town like Geneva could have succeeded in getting at many of these sources of information. And though the loss of knowledge from this deficiency in Dr Lombard's book may not be much noticed on the Continent, it must seriously diminish its value to English readers. The book which, to our knowledge, gives most information upon the hill stations, especially in India, is Dr Norman Cheever's "Brief Review of the Means of Preserving the Health of European Soldiers in India, Part II."

In case Dr Lombard should think our strictures on this point are owing to ruffled national vanity, we shall go over some instances where he has been led into mistakes and unfortunate omissions from his ignorance of what has been observed in the Himalayan stations and other tropical sanitaria. It may be as well for the writer of this article at once to note that he has lived for above two years amongst the Himalayas, as well as for twelve months amongst the French Alps, and has thus had some opportunities of studying the effects of mountain climates.

The only book which Dr Lombard seems to have consulted on the subject of the Indian sanitaria, is that of Dr Baikie on the Neilgherries, published in 1857. Lombard's list of these stations is very incomplete. He only mentions eight Himalayan sanitaria, missing out, amongst others, Mussourie, Dharmsala, Dalhousie, Kussowlie, Dugshai, Sabathoo, Chuckrata, and Raneekhet. The names of those he gives are occasionally spelt right, and in other places spelt wrong, and their elevations are incorrectly given: for example, the height of Darjeeling is given as 2442 mètres; of Simla, as 2135 mètres; Murree, as 2280 mètres; whereas, according to Cheever, they stand as 8008 feet for Darjeeling, 8000 feet for Simla, and 7300 feet for Murree. Dr Lombard actually says, p. 55,—"We have no precise knowledge of the diseases contracted by the inhabitants of the high valleys of the Himalayas." At page 72, he speaks as if cholera was prevalent at the height of 2000 mètres; and at page 120, he says that cholera is not arrested by elevation, and is as frequent in mountainous regions as in the subjacent plains. But it is well known that though cholera occasionally reaches the height of 6000 feet in the Himalayas, it never spreads far, and soon passes away. Had Dr Lombard known something more of the experience gained in our hill-stations in India, he would probably not have recommended high elevations so strongly for those who returned to Europe labouring under intermittent fever. For it may be said as a general rule, that those stations have been more useful as sanitaria where European troops may live without falling a prey to the diseases of tropical climates, than as sanitaria or convalescent depots, where they go to recover from these diseases after they have contracted them by a residence in the plains.

Our author, though he mentions the Lawrence Asylum at Sanauer, has not tried or has failed to get the statistics of a station 6000 feet high, which has now seen its twenty-seventh year, where nearly 500 children of European parentage are kept. We have in our possession a little book, printed at Sanauer, which gives the medical statistics of the Institution. It appears from these statistics that the number of deaths in the first fourteen years of the Lawrence Military Asylum, gives a percentage of 1·74, the ages of the children running from four to sixteen. This is somewhat high; but the mortality could scarcely be expected to be as low as in similar institutions at home. The more powerful and vertical sun, the periodical rains, the sultry valleys below, and the absence of the sea-breeze, all join to make Sanauer a climate more pleasing perhaps, but less invigorating, to the child of the British soldier.

Then again, at page 5, Dr Lombard gives as a rule that the limit of eternal snow and that of cultivation is higher on the southern slopes of mountains than on those turned towards the north; but he omits to notice the very remarkable fact, that in the Himalayas, from a combination of physical conditions, the snow-line is from 1500 to 2000 feet higher on the Thibetan or northern side, than on the Indian or southern side. It is needless to say that we have no mention of the great meteorological phenomena of the clouds of the monsoons striking against the mountains, and the great rainfall in the hills in India, which at Cherra Poonjee, a station 4200 feet high, rises above 600 inches in the year. In like manner, Dr Lombard might have enriched his book by studying what has been observed amongst the Blue Mountains of Jamaica, which are the oldest hill-stations for soldiers in hot climates; but enough has been said on the subject of his omissions.

There is no mention of any ascertained facts upon the effects of a great elevation upon the bodily temperature, and this emboldens me to add a note of eighty observations made by me upon the temperature of the body at Kussowlie, 6400 feet high. They were read by a friend several years ago to the Royal Medical Society of Edinburgh, but, as far as I know, have never yet been printed. These were made with a sensitive thermometer taken from Regnault's hygrometer, placed under the armpit on the 23d, 24th, 25th, and 26th October 1859, between 12 and 4 o'clock. The temperature in the shade was about 65° to 70°, and in the sun from 84° to 90°. It may be noticed that Hindustanis would never suffer the thermometer to be placed in the mouth. There were seven Europeans, five of whom were in the Hospital; the sixth was on medical leave, the last in good health.

Adult Males (Europeans): 97°, 98°, 99°, 97°, 97°, 97°, 97°. (Hindustanis) mostly Hindus: 98½°, 97°, 97° (old man), 97°, 96½°, 99°, 97°, 98°, 95°, 98°, 97°, 97°, 95°, 97°, 98°, 97° (during intermission of ague), 98°, 97°, 97°, 96°, 97°, 96°, 97°, 98°, 97°, 97°, 97°, 97°, 97°, 97°, 97°, 98°, 98°, 95½°, 98°, 97°, 97°, 98½°, 95½°, 97°, 95½°, 99°, 98°, 99°, 96°, 97°, 98°, 97°.

Adult Women (all Hindustanis), old: 98°, 97°, 97°, 98°, 97°, 97°, 95½°, 96°, 97°.

Boys: aged 3 years, 98½°; 5, 98°; 6, 97°; 7, 95°; 8, 96°; 9, 98°; 10, 98°; 10, 98°.

Girls: aged 5 years, 97½°; 8, 99°; 10, 97.

Infants (twin): 6 months, 98°; other twin, 99°; ten months, very ill, died next day, 95°; child, age not given, 95°.

It would appear from these observations that the bodily temperature is somewhat lower at a great elevation than in the plains of India.

The last sixty pages of the book are devoted to a description of European mountain resorts likely to be beneficial to those in search of health.

Surgical Emergencies, together with the Emergencies attendant on Parturition and the Treatment of Poisoning. A Manual for the Use of General Practitioners. By WILLIAM PAUL SWAIN, F.R.C.S., Surgeon to the Royal Albert Hospital, Devonport. With 82 Engravings. London: J. and A. Churchill: 1874. Pp. 220.

THIS work is intended to supply directions for the immediate treatment of all those various emergencies with which the general practitioner may be called upon to deal at any moment. As it is only a compilation, it is not much open to criticism, except as to the selection of subjects. This has, we think, been, as a rule, excellently managed, and the result is a most useful little work. Here and there further details might with advantage have been given. As, for instance, in describing the operation of tracheotomy, it is only by implication that a guess can be made as to the relation of the tracheal incision to the isthmus of the thyroid; nor are the special difficulties met with, and precautions required, in operating on young children, alluded to at all. In discussing amputations of leg and foot, while Chopart's and Hey's are briefly described, Syme's is not alluded to. The chapter on fractures and dislocations is good, though we notice the only mode of treating Colles's fracture is that recommended by Dr Gordon of Belfast, which some surgeons find so difficult to manage.

The chapter on antiseptics, put in at the end, begins with rather a damper:—"The mere use of antiseptic dressings will not of itself yield successful results to the surgeon. He must give unremitting attention to all the minutiæ of application which have been deduced from the germ theory of putrefaction," etc., etc. It is clumsily written, and full of the sort of jargon which is well understood in Edinburgh, but we fear will rather interfere with the adoption of the method by those who have not seen it in use.

The well-known names of Mr George Lawson and Dr Meadows add value to the chapters they have written—the diseases of eye, and emergencies of parturition.

Vital Statistics of the Bengal Presidency. Calcutta: 1874.

WE have here collected in three large volumes the vital statistics of the Bengal Presidency. The first volume contains the returns of sickness and mortality of the European army from 1858 to 1869, of the native army since its reorganization in 1861, and of the jails for each year from 1859.

The second volume treats of the age and length of service as affecting the sickness and mortality of the European army. The third treats of the cholera epidemics of recent years viewed in relation to former years, and gives statistics of cholera in the Bengal Presidency from 1817 to 1872.

These reports are compiled by Dr James L. Bryden, Statistical Officer attached to the Sanitary Commissioner with the Government of India. Most of the documents which make up these three tomes have been already reviewed in the *Edinburgh Medical Journal.* They are, we believe, the only statistics of the kind collected in an Asiatic country, and are full of lessons of the greatest significance to those who wish to study the phenomena of disease and the influence of climate on a wide scale. Much praise is due to Dr Bryden for the clear and careful manner in which he has framed his tables and worked out the deductions which he has made from the large number of facts at his disposal.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LIII.—MEETING IX.

Wednesday, 1st July.—Dr RUTHERFORD HALDANE, *President, in the Chair.*

I. *Dr James Dunsmure*, jun., read his paper, entitled, NOTE OF A CASE OF LOSS OF VOLUNTARY POWER PRODUCED BY A TOUCH ON THE HEAD. This paper will appear in a subsequent number of this Journal.

He showed the patient, a fine bright-looking little boy of five years of age. When touched on the head suddenly, before he was aware, he fell down at once, in a sitting posture, as if he had been shot, but with no loss of consciousness. He soon recovered; and subsequent blows or taps, when he was looking out for them, produced no effect whatever.

In relation to the above case, *Dr Joseph Bell* showed photographs of a remarkable CASE OF TUMOUR OF FOREHEAD AND EYEBROW, which, under examination and pressure, took epileptic fits of great severity. It was probably an encephalocele.

Dr Matthews Duncan thought the case in some respects resembled eclampsia nutans, a very rare form of epilepsy, in which the head of the patient goes down suddenly for a moment, and gets up again as quickly.

Mr William Brown was glad that this case, so interesting and rare, was under observation.

Dr D. Gordon felt interested in knowing whether or not the head of the child had been subjected to any undue pressure during delivery. To this Dr Dunsmure answered that the labour seems to have been a normal one.

Dr M'Kendrick said, This case presents many interesting points of resemblance to the convulsive attacks that can sometimes be produced artificially in guineapigs after section of the sciatic nerve or portion of the spinal cord, as discovered by Brown-Sequard, who does not, however, give any satisfactory explanation of the phenomena. I have seen another case very like this, shown me by Dr Morrison Watson, who, I had hoped, might have been present to-night. It occurred in a young vigorous *hen*, which, otherwise healthy, went into convulsions, not followed by stupor, whenever it was touched; unfortunately it has now recovered. Dr Dunsmure's case and the *hen's* differ from the case of a guineapig—which I possessed for some time, and which was sent to Professor Bennett by Brown-Sequard—that epileptiform seizure in the former was not followed by stupor, while the guineapig was always insensible after its attacks.

II. *Dr James Dunsmure*, jun., showed some SPECIMENS which were taken at a post-mortem examination at the Children's Hospital from a boy who was admitted at the end of March, and died in the beginning of May. They consisted of a tumour of the abdomen, which extended from about two inches below the ribs in the right mammary line to about the edge of the ninth rib in the left side, of an enlarged thymus gland, a number of masses of enlarged lymphatic glands from the thorax and abdomen, and a spleen with a deposit in it resembling the tumour. The specimens had been sent to Dr Blair Cunynghame, who examined them for Professor Sanders, the Pathologist to the Hospital, and who was of opinion that the tumour presented the character of lymphadenoma.

Dr James Dunsmure showed a section of the tumour prepared by Mr Hardie, under a microscope, and which exhibited numbers of lymphoid cells in a fine fibrous stroma.

III. *Dr Stephenson* then read a paper on THE ECZEMATOUS ERUPTIONS AND ECZEMATOUS ASTHMA IN CHILDREN. While drawing the attention of the profession to the association of asthma with infantile eczema, the author takes the opportunity of dissenting from the nomenclature regarding eczematous eruptions in children, which is being introduced by recent writers who follow Hebra in his classification. He prefers the old names of porrigo larvalis, eczema, and impetigo, as conveying ideas not limited to mere external characters. While, as viewed by dermatologists, they belong to the eczemata, they nevertheless should be regarded as clinically distinct affections.

The influence of age or development in determining their origin and course cannot be overlooked. Each has its distinct period. Porrigo and eczema frequently affect several members of a family, but not indiscriminately—the two are not to be met with in the same family.

The natural history of each affection, apart from mere external characters, was sketched. Eczema proper, the author believes, is dependent upon developmental conditions, and in this relationship we have a satisfactory explanation of its varying phenomena, its obstinacy under treatment in the earlier years, and its tendency to spontaneous cure when the developmental conditions change. The natural limit the author places in the sixth year.

The association of asthma with eczema is mentioned by Dr West, the only writer who specially refers to it. Two cases which came under the author's notice are recorded. In one the attacks were distinctly associated with derangement of digestion. Under regulation of diet and iodide of potassium, the attacks have greatly diminished.

The President, in thanking Dr Stephenson in the name of the

Society for his paper, said that, as was usual with his communications, it was both interesting and able, though he could not quite agree with his views as to the classification of eczema, as he believed that the subdivisions given by Dr Stephenson were all varities of the same lesion. The connexion of such cases with asthma was interesting and important.

Dr T. G. Balfour stated that he has at present under his care a child who, from the age of fourteen days, has suffered from general eczema of the whole body. In its case, if the eczema begins to moderate or nearly disappear, dyspnœa follows, and the chest becomes filled with bronchial râles; also, at times, there is a heaviness of the head as if congestion was present, followed by vomiting; which symptoms passed off, whereon the skin again became affected. The child is now nearly two years old, and the disease is still going on.

Dr Blair Cunynghame had seen a family, all the members of which, during the period between first and second dentitions, suffer from eczema of the body generally, with symptoms of spasmodic asthma, all of which pass off when the second dentition is over, leaving the skin whole and healthy-looking.

IV. *Dr Blair Cunynghame* them read his paper, entitled, CASE OF MECHANICAL OBSTRUCTION TO THE FLOW OF URINE FOR ELEVEN DAYS, which will appear in an early number of this Journal.

The President said that two points of great interest were, first, protracted period of the suppression of urine, and, secondly, the absence of uræmic symptoms. The pathology of the case was extremely obscure, nor could much light be thrown upon it. Rare as such a condition is, and still rarer the diagnosis during life, the idea of the presence of a horseshoe kidney with one ureter might explain the symptoms if this was blocked by a clot or calculus.

Dr Carmichael could not aid in the diagnosis of Dr Cunynghame's case, but wished to mention that he had under his care at present a case of scarlatinal nephritis, in which a remarkable suppression of urine had existed. For forty-eight hours no urine at all was passed, and during the next three days only about one ounce in the twenty-four hours; but no bad symptoms had followed, not even a trace of dropsy, and now the secretion was re-established.

EXTENSION APPLIED TO FLAPS.—We are requested by Mr Lister to state, that his attention has been directed to the fact that Dr James Morton of Glasgow published, in the *Glasgow Medical Journal* for February 1873, an account of the treatment of stumps by extension by means of adhesive plaster applied to the skin, and connected with a weight, in order to counteract retraction of the soft parts. Mr Lister regrets that at the meeting of the Medico-Chirurgical Society of Edinburgh, on the 3d June, an account of which appears in the last number of this Journal, he should have described as originating with himself a practice which he now learns to have been previously pursued by Dr Morton.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXIII.—MEETING XIII.

Wednesday, 10*th June*.—Dr J. MATTHEWS DUNCAN, *President*, in the Chair.

I. *Dr Matthews Duncan* read an account of a case of severe DIABETES INSIPIDUS. It had a great general resemblance to one of diabetes mellitus which he published in this Journal in February 1873. In the present case, miscarriage occurred spontaneously, and the very alarming symptoms which were present did not end fatally. But, apart from these important differences, the cases had a strong general mutual similarity.

Dr Macdonald was much interested in Dr Duncan's case, which was well reported. He had not met with a case of diabetes insipidus associated with pregnancy, but he had a case at present under his care without that complication, and which was a very typical one. It was an interesting question, whether the blow on the head received by the woman might not have had something to do with the causation of the malady in Dr Duncan's case; and if such connexion could be made out, it might help to support the view of Bernard regarding the influence of irritation of collateral portions of the floor of the fourth ventricle in producing both diabetes mellitus and diabetes insipidus. In regard to the question of sterility, his experience would not enable him to say much; but in regard to the males, who usually were considered sterile, it happened that he had a male patient afflicted with diabetes mellitus who acknowledged at least that desire and coitus were as strong as ever. Although this gentleman had been twice married he still remained childless, so that all that could be said in his case was that impotence was absent.

Dr Wilson inquired if Dr Duncan's patient had wasted much, and Dr Duncan replied in the negative.

II. *Mr Hardie* read notes of the DISSECTION OF A MALFORMED FŒTUS, and showed diagram and specimen of the same, an account of which will appear in an early number.

Dr Duncan said that Mr Hardie's paper suggested some physiological problems, as, for instance, the function of the kidney during fœtal life. The allegation that the fœtus secretes urine freely during intrauterine life, must be taken with some reserve. In a case that came under his observation, the following facts were made out. There were impervious ureters, and what was called ascites, but in reality distended bladder. On dissection, it was found that the latter had no connexion with the kidneys; at least there was nothing like a pervious canal. In the situation of the kidney were some masses of cystic degeneration. Distension of the bladder, then, is no proof that the fœtal kidneys secrete urine. He had made other observations in reference to this. In 1870 he published the case of a child who had neither kidneys, ureters, bladder, nor genital organs, but which notwithstanding was well developed in every other respect.

Dr Balfour inquired of Dr Duncan whether, in the case of the child with distended bladder and no ureters, he did not think that the disappearance of the latter had been caused by the pressure of the said bladder. It was quite reasonable to suppose that the enlarged bladder reacted on the ureters, and induced that degenerate cystic condition which Dr Duncan had noticed.

Dr Rattray inquired if Mr Hardie could tell whether or not the mother of the malformed child had received a fright, but Mr Hardie was not aware of such being the case.

Part Fourth.

PERISCOPE.

Dr Taylor's Paper.—Dr Taylor has received the following Notes confirmatory of his paper on Coal-Gas since its publication in our last Number:—

Note I.

When this paper was first published in the Journal, Professor Maclagan's case (page 25) was under treatment. The Professor informed me of it in a private note, which, although not intended for publication, I take the liberty of partially reproducing here, as I could not state the case more graphically:—" . . . A bachelor gentleman, having occasion to be up in the night-time, had, in trying to put out the gas in the bedroom, turned it on full swing. It was a fishtail burner, giving out at least three feet per hour. The room is only of about 750 cubic feet in capacity. The gas could not have been escaping more than four hours, yet we found him entirely comatose, respirations 30–36 per minute, pulse 120, very feeble, the eyes steady, pupils not in the least dilated, breath smelling strongly of gas. He owed it to the common sense of the servant, who opened the windows well, that he was not worse. As it was, he was in a very perilous state for a while; but removal to another room, cold affusion in a mild way, brandy, and strong tea, have brought him round."

Dr Affleck has since supplied me with the remaining particulars:—

"Mr S. rallied from the immediate effects of the coal-gas poisoning, but continued to be somewhat confused in mind, and did not regain strength. About ten days after the accident symptoms of pneumonia appeared, under which he sank rapidly, and died three days thereafter. It is right to mention that Mr S. had long been the subject of slight valvular disease of the heart."

NOTE II.

Dr John Smith of this city has sent me the following:—

"While passing by the corner of Great King Street and Pitt Street, many years ago, I was surprised to see one of three men working in a not very deep excavation in the causeway, fall down as if in a fit. One of the men ran forward, and in trying to drag the fallen man out, fell down himself also. The third man ran forward to the assistance of the other two, and also fell. I went up to the place and found the last man lying half out of the hole, and dragged him on to the causeway; and in the meantime some others got the remaining two men out. Both of them were quite insensible, the third recovering consciousness in a few minutes, but having to be supported by his comrades even when in a sitting position. Some brandy was attempted to be given the two worst cases, but neither was capable of swallowing it; the other man managed to accomplish this. All were removed in cabs, I think, to the Infirmary. Of the result I am not aware. The cause of the accident was the sudden opening of one of the large gas mains, with the effect of an overpowering volume of the gas surrounding the men at work. The whole occurrence occupied but a few seconds, illustrating the short exposure required to produce the deadly effects of this poison when in an undiluted state."

AN UNNATURAL POSITION OF THE HEAD A CAUSE OF DEATH FROM CHLOROFORM AND OTHER ANÆSTHETICS. By G. W. COPELAND, M.D., Boston.—In the *Boston Medical and Surgical Journal* of 26th February, I published a short article on the "Styloid Muscles and Anæsthetics," in which I referred the case of impeded breathing during anæsthesia to the action of the styloid muscles closing the glottis. I also pointed out how the difficulty could always be relieved without making traction on the tongue, simply by tilting the head forward in a natural position, so as to relax these muscles and permit the patient to breathe through the nose.

It has since occurred to me that many of the deaths which have resulted from the use of anæsthetics may have been due to the imperfect knowledge that has existed regarding this matter. The difficulty experienced in keeping the air-passages free has, ever since the discovery of anæsthetics, been the most troublesome and dangerous complication attending their use. All authorities agree that obstructed or impeded respiration is a symptom attended with great danger to the life of the patient, and always requires prompt and immediate attention.

Waring, in his book on Practical Therapeutics, sums up the experience of the profession with chloroform, in the following observations: "Watch carefully the respiratory movements, and the colour of the cheeks, lips, and eyes. Signs of danger: lividity of the face, stertorous respirations, irregular gasping respirations, feeble pulse, death-like pallor." His directions are, "Stop the chloroform, open the mouth, draw out the tongue, and watch carefully."

When we consider the ways in which deaths occur during anæsthesia, we see that these signs of danger have not been so designated without sufficient reasons.

Gant, in his Science and Practice of Surgery, speaks of death from chloroform as follows: "During inhalation, death may occur in three different ways: by asphyxia, by cardiac syncope, or by coma.

Asphyxia is indicated by the ordinary symptoms, "lividity and turgescence of the face, violent respiratory efforts, and cessation of the pulse and of the heart's action."

In cardiac syncope "the patient, after a few inspirations, suddenly becomes pale and faint, the pulse beating almost imperceptibly for a few moments, and then ceasing, although the respirations may continue; death taking place by paralysis of the heart."

"Coma presents the same appearance as asphyxia, but without failure of the heart's action; death resulting from congestion of the brain."

In two of these three modes of death we then see that there is impeded breathing and improper aeration of the blood, as evinced by the lividity of the face. The great mistake up to the present time has been in considering the difficulty with the breathing, a symptom arising from the use of anæsthetics or a sign of full anæsthesia, and not a mechanical obstruction of the glottis from an unnatural position of the head.

The *Lancet* of 1st February 1873 contains a report by the editor of a "Case of Fatal Suffocation from Nitrous Oxide Gas," in which a dentist is related as having administered that agent for the purpose of extracting a tooth. He says, "It was not till after the operation was completed that anything unusual happened, but immediately afterwards the face became livid, and the 'features,'" it is said, "commenced to 'swell.'" He refers death in this case to asphyxia.

In a case of death from the bichloride of methylene, which occurred at the Charing Cross Hospital in the practice of Mr Canton, it is stated that "one nostril was closed by the tumour, thus obstructing respiration, and the patient was subjected to the influence of the bichloride in the sitting posture."

In the *Lancet* for 6th September 1873, the editor, in commenting on a death from chloroform which happened in a dentist's chair at

Brighton, the post-mortem showing fatty degeneration of the heart, says, "It is one of those cases when death seems to have followed rigidity of muscle, and it is questionable whether asphyxia may not have helped, as it were, the fatal syncope."

It seems to me very plausible that cardiac syncope may be induced by the momentary closure of the larynx depriving the heart of its natural stimulus in patients suffering from shock or fatty degeneration, or already reduced by disease. It is a significant fact that all the deaths from nitrous oxide gas, and a large number of those from other anæsthetics, have taken place while the patients were in a sitting posture, which would allow the head to fall back farther than if they were lying down, thus favouring the theory that interference with the free action of the lungs may have been the primary cause of death. It must be remembered that closure of the glottis may occur without our attention being directed to those struggling efforts on the part of the patient which would happen were voluntary efforts possible, and the first noticeable symptoms of danger may be lividity of face or death-like pallor.

It may not be out of place here to refer to the many deaths from intoxication, apoplexy, and coma from whatever cause, as being in some instances hastened, and perhaps even produced, by interference with the respiratory functions from an unnatural position of the head.

There is one other point to which I wish to allude, and it is the importance of elevating the head sufficiently to compel the patient to inhale the anæsthetic through the nares entirely. If deep inspirations be taken through the open mouth, the lungs are inflated instantaneously and just as rapidly emptied, leaving a long interval without any of the vapour being in the lungs. If the inhalations be through the nares, it takes a much longer time to inflate the lungs and a much longer time to empty them, leaving no interval. Now, the number of respirations per minute is the same either way: it follows that it will require a longer time to effect anæsthesia through the mouth than through the nose.

It appears evident to me that if attention be paid to the position of the head during anæsthesia from any agent, a greater degree of safety will be obtained than has hitherto existed.—*Philadelphia Medical Times*, 30th May 1874.

[Dr Copeland here states very correctly that it appears evident to him "That if attention be paid to the position of the head during anæsthesia from any agent, a greater degree of safety will be obtained"—but he adds, "*than has hitherto existed.*" Falling back of the head he considers as the position likely to cause danger, which he attributes to interference with the respiration. The danger of this position has, however, long ago been pointed out, as, on referring to the *Edinburgh Medical Journal*, p. 331, for 1865, he will find a paper on certain positions of the head as a cause of danger in operations. The risk is there shown to arise from *syncope,* produced by pressure on the internal carotids. Since that time I have had abundant opportunities of substantiating this opinion, while the impeded circulation, capable of being thus produced, has been during the same period frequently demonstrated in our Anatomical Class Rooms.—J. S.]

Part Fifth.

MEDICAL NEWS.

MEETING OF THE GENERAL MEDICAL COUNCIL,

HELD AT THEIR HOUSE, OXFORD STREET, LONDON.

First Day.—Thursday, 9*th July* 1874.

The General Medical Council met on Thursday, the 9th July, in their new premises, formerly the Royal College of Chemistry, in Oxford Street, at two o'clock—the President, Dr Paget, in the chair. There were present, besides the President, Dr James Risdon Bennett, Mr Richard Quain, Mr Edward Bradford, Dr Henry W. Acland, Dr George M. Humphry, Dr Thomas Thompson Pyle, Dr Andrew Wood, Dr John G. Fleming, Dr Allen Thomson, Dr Aquilla Smith, Dr James Apjohn, Dr Edmund Alexander Parkes, Dr William Sharpey, Dr Richard Quain, Sir William Withey Gull, Bart, M.D., and Dr William Stokes.

The following new members were introduced to the Council:—Dr Daniel R. Haldane, Professor William Turner, M.B., Dr Rawdon Macnamara, and Dr James Warburton Begbie.

In his opening address, the *President,* after some details as to the new building in which the Council met, alluded in the following terms to members who had left the Council and to the visitors of Examining Boards:—In opening the session in this spacious hall, I have only one regret—that all those who sat with us in the Council last year are not here to-day. Four of them are absent—Sir Robert Christison, whose words added weight to any debate, whose name has for so many years been known and held in respect wherever Medicine is studied, representing as he does, in the highest degree, all that for which his University has long been famous; Dr Alexander Wood, who, like Sir Robert Christison, was from the first a member of the Council, and whose great capacity for business, and equal or even greater gift of oratory, must have made him a marked man in any position in which he might have been placed; Dr Macrobin, who was kindly, candid, honest, and able. I think it one of the many happy incidents of my connexion with the Council that it gave me his acquaintance, and, I hope, his friendship. And we miss, too, the genial smile of our friend Mr

Hargrave; but our new colleagues must not think themselves less welcome because we do not forget their predecessors. We see in their presence that, however great may have been any one of our losses, it is not too great to be replaced. Since the last meeting of the General Council, the examinations of some of the medical authorities have been visited and reported on. It would be superfluous for me to say much of these reports; they tell their own tales, and tell them with such manifest ability as to require no commendation of mine. And they do more than convey information respecting particular institutions: they raise some questions of a general kind, the discussion of which cannot fail to be serviceable to that which is our great object—the advancement of medical education, and of the standard of acquirements in our profession. But though I say no more than this of the reports themselves, I may be expected to make some mention of the arrangements of the Executive Committee for carrying out the visitations. In the selection of visitors, regard was had to prior experience as examiners. Their number was purposely limited, so as to allow of one visitor inquiring into the examinations of more than one licensing body, and thus helping to guide us towards an equivalent of standards in parallel cases. I am sure the Council will think the Executive Committee fortunate in having obtained the services of men so eminently qualified, and whose statements and opinions are entitled to so much respect. Alluding to the powers, objects, and success of the Medical Council, he congratulated the Council upon progress made, and improvement in the qualifications of the members of the profession in general. We know that a few years ago, in the examinations for medical commissions in the army or navy, it was not uncommon to find about 40 per cent. of the candidates ignorant and incapable, though already in possession of diplomas both in Medicine and Surgery. Of late these discreditable failures have become so few as to be almost, if not quite insignificant. I am happy to say that on the very last occasion of examinations for army medical commissions, that of March 1874, which will be laid before you to-day, there was not one of them—not one of these failures. And surely the like signs of improvement are equally manifest throughout our profession. Teachers tell us so. Laymen have no doubt of it. Certainly my own experience is so. I know not a few young village practitioners whose acquirements might have placed them, a few years ago, in the foremost rank of practitioners in large towns. I do not claim for the Medical Council all the [illegible] these improvements. Something is due to the ad-[illegible] doing better and better, which pervades our [illegible] kept alive by the medical journals. Some share [illegible] also fairly be given to the licensing bodies. All [illegible]roved their examinations, and some of them have [illegible] example, and seconded this Council with a most [illegible]blic spirit.

At the conclusion of what must have been a most interesting address, Dr Paget left the chair, and then retired from the Council. A vote of thanks was unanimously accorded to him for his services, and Dr Andrew Wood proposed his re-election, which was seconded by Dr Apjohn, and unanimously adopted. A messenger was at once despatched to Dr Paget, who had left the building. On his return he was informed of his re-election, and on again taking the chair he expressed his high sense of the honour conferred upon him; adding, however, that he could not hold the office longer than the present session.

The report of the Executive Committee as to the new Offices of the Council was then presented and approved.

Reports of visitations of examinations were then presented, and after some discussion, a motion by Dr Andrew Wood, "That the reports of the visitors of the examinations be received and entered on the minutes," was opposed by Professor Turner, who moved as an amendment, "That the reports of the visitors of examinations be received, but held for the present as confidential." He agreed with Dr Storrar as to the advisability of avoiding anything like ill-feeling on the part of the bodies visited in consequence of the remarks of the visitors, which might seem rather hard upon them. Only a certain number of bodies had been visited, and until all had been inspected it would place those which had borne the brunt of the visitation in an invidious position to have the reports published and circulated.

Dr Haldane said that, as representing one of the visited bodies, he thought it desirable that the reports should be printed and discussed immediately. The Council was not at present responsible for the reports, which only expressed the opinions of the visitors.

The amendment was then put and negatived.

Sir William Gull then moved, "That the reports of the visitations of examinations be considered to-morrow in committee of the whole Council."

The motion was seconded by *Dr Apjohn*, and, after a short discussion, adopted.

On Friday, accordingly, the reports were considered.

1. *The Society of Apothecaries of London.*

On this examination considerable differences in opinion seemed to be held. Some of the candidates had shown deplorable ignorance, while, on the other hand, members of the Council seemed to think some of the questions too extensive in range and too difficult. The subject of the absence of a surgical examination in the Apothecaries' license was commented on.

2. *The Colleges of Physicians and Surgeons of Edinburgh.*

The reports of the visitors of the first and second conjoint aminations of the Royal Colleges of Physicians and Surgeons of Edinburgh (Dr Parkes and Mr T. Holmes), held in July 1873, were laid before the Council, and copies were ordered to be forwarded to those bodies for their consideration and remarks.

The *President* asked Dr Parkes if he desired to raise any question on the advisability of setting three or four questions and requiring answers to only two or three.

Dr Parkes thought that the matter should be considered by the two Colleges, and that it was hardly desirable at present for the Council to pass a special resolution respecting it.

Dr Haldane thought it was desirable that the opinion of the Council should be expressed on the matter, particularly as Dr Parkes was of opinion that the present mode was not altogether judicious. At one time the system was adopted of requiring answers to all the questions; but it was found that in so wide a subject a candidate might be unfortunate with regard to one or two questions, and might be rejected in consequence. After due consideration, the Colleges came to the conclusion that it was better to give a certain latitude, and permit the candidate to answer a smaller number of questions than those set.

Dr Andrew Wood said, if the written examination were the only one to which the candidates were subjected, he should consider the system an erroneous one; but it was followed by an oral examination, in which no option was given to the student as to the questions to be answered. Respectful consideration, however, would be given to the suggestions that had been made. The Colleges only desired to have their examinations so conducted as to secure that no incompetent person should be admitted to the profession. He was sure that the visitors would do them the justice to say that they arrived at a time when there happened to be a most unfortunate batch of candidates, who showed the most deplorable ignorance of the subjects upon which they were examined. It would also be admitted that the candidates in question met with condign punishment. He believed that nearly all those candidates came from other parts of the country; and the Edinburgh School should not be judged by the answers which were given by them.

Dr Sharpey thought that the Council should know the sources whence they obtained their preliminary education, which was utterly deficient.

Dr Andrew Wood was certain that none of the candidates were examined at the Edinburgh preliminary examination, which was of a most stringent character, as was shown by the fact that at the last examination in Latin, out of 22 or 23 candidates only 6 passed. Men were invariably rejected for bad spelling.

Dr Bennett hoped that Dr Andrew Wood would obtain a return of the number of rejected candidates at Edinburgh, with a statement of the places where they obtained their preliminary education; and that a similar return would be presented from Ireland.

Dr Andrew Wood said he would be happy to communicate the information in regard to Edinburgh.

The *President* thought that the principle of requiring only a certain proportion of the questions to be answered was an erroneous one, because it was impossible to tell whether the candidates were or were not ignorant as to those that were unanswered. If there were sufficient time to answer all, and all were required to be answered, the inference to be drawn from any that were left unanswered was that the candidate was ignorant of them. It was desirable that the questions should not be too few. If there were a sufficient number of subjects and sufficient time allowed, the examiners could ascertain not only what a candidate knew, but what he did not know.

Dr Andrew Wood said that the object of limiting the number of questions to be answered was that the candidates might have sufficient time to answer them in order not to encroach upon other subjects.

Mr Quain said that he had examined young men for fifteen years of his life, and he was quite sure that they could not nicely calculate the time to be devoted to the particular questions; and it ought not to be assumed that, if there were any questions left unanswered, it was on account of their ignorance.

Professor Turner thought that the subjects should not be mixed up in the way that they were described to be in some of the reports, and that a greater interval of time should be allowed between the examinations in different subjects. As far as possible the papers should be on one subject only, and after the examination a certain time should be allowed to the candidates to get a breath of fresh air and to prepare themselves for entering upon a new subject. With regard to the number of questions to be answered, he thought that a certain latitude ought to be allowed, and that it was not fair to assume the ignorance of the candidate with regard to questions which he left unanswered. If a candidate were well posted in certain parts of the examination, he would naturally select such parts for his answers, and might continue writing until the time was exhausted.

Dr Apjohn said that some of the candidates in chemistry were deplorably ignorant.

Dr Thomson had examined very many classes, and had tried a variety of ways. He would not like to be tied to any mode of proceeding. He pointed out that if the number of questions proposed be answered during the time, that would be a sufficient test of the knowledge of the candidate. That was the main point to be secured. He would not say that in many cases a written answer to one or two questions would be sufficient; but if in the opinion of the examining board three or four questions were a sufficient test of the qualifications of the candidates, then they ought to be satisfied, whether a greater number of questions had been proposed or not. He had pursued both plans, and found advantages in both. On the whole, he thought it more precise and more simple to limit the number of questions.

Dr Sharpey had observed that the candidates varied very much in ability; some answered the questions elaborately with great care and detail, and others again more concisely. By setting a moderate number of questions and insisting on their giving answers, it gave an opportunity for the different kinds of minds to show what they were made of. It might be said you must answer a certain number.

Dr Humphry's feeling was, that this was a question on which no opinion of the Council should be given. Professor Turner spoke of latitude to the student, but he thought a certain amount of latitude should be allowed to the examiners. The Council by a decided opinion would be rather committing itself in a direction in which he thought it better that they should not lay down specific rules. Having visited the University of Glasgow, he had come to the conclusion that it was not a point of very great importance; he saw advantages on both sides.

Dr Storrar said he could not speak from his own experience as an examiner, but only from a good deal of experience as a superintendent and an observer of examinations, and as one who knew the views of examiners on the subject. In the University of London examinations, as well as in the Civil Service examinations, the practice was to set a greater number of questions than were expected to be answered, and then to limit the number that were to be answered. Say, for instance, six are to be answered: nine are set, and a heading put to the paper that not more than six of those questions are to be answered. The reason is this: Superficial men who did not know any question thoroughly would take refuge in a sort of general sketch of all the questions, in such a way as to perplex the examiner, and make it exceedingly difficult for the examiner really to discover what was the amount of precise information that the candidate had on any one subject. He did not argue for it, but he simply mentioned it in order to show that there was an argument for that side of the question.

Dr Aquilla Smith agreed with the observations made by Professor Turner. He had a great objection to the practice of setting four questions and not permitting the candidate to answer more than three. The practical result was that it was quite unnecessary to set more than three questions, for a curious result manifested itself; as stated by the examiners, "It will be observed on reading the answers that no one attempted to answer the fourth question."

Dr Fleming did not think it was a question so much of the number as of the kind of questions. If they were such as to test the candidate's knowledge, that was sufficient.

Dr Parkes did not think that he and his colleagues attached much importance to the point which had been so much discussed. They were very much struck by the fact that the fourth question was altogether avoided. The other questions noticed in the report appeared to him to be far more important. One was the extremely short time given in all the subjects, in the second examination specially. Occasionally similar questions were put in both written and oral examinations, owing to the fact that the same examiners did not conduct the inquiry.

The next report considered was with reference to the reports on the examinations for the single qualification of the Royal College of Surgeons of Edinburgh.

Dr Bennett confirmed the statement made by others as to the extreme inefficiency of the candidates. He moved—"That the reports of the visitors of examinations for the single qualification of the Royal Colleges of Physicians and Surgeons of Edinburgh be forwarded to those bodies for their consideration and remarks."

Dr Aquilla Smith thought the prescriptions written out by the candidates betrayed great ignorance of the Latin language.

The President observed that the report did not state whether the candidates who gave those answers were passed or rejected.

Dr Haldane could not at the moment say the results of the examinations, but he could easily get the results. With reference to the statement of Dr Bennett, that the College of Physicians grants its licenses without examination in Surgery, this was perfectly true, but would very soon be rectified. The College of Physicians, till after the passing of the Medical Act, was not a licensing body. In connexion with the College of Physicians a conjoint examination was necessitated, the College of Surgeons being answerable for the surgical part, and the College of Physicians for the medical part. Latterly, a very few students—men possessing no qualification—had presented themselves, and he was sorry to see that the College had not instituted an examination in surgery; but he could say, as to the College of Physicians, that when the regulations came up for revision—which will be in the first week in August—the deficiency would be supplied and the examiners would be appointed for the examination of those candidates who have not already passed an examination in surgery.

Mr Quain having seconded the resolution, it was carried.

Dr Andrew Wood pointed out that at page 76 there was a note —"Answers to these questions we did not receive." He was anxious that no slur should rest upon the College he represented, as they had not refused to give up the answers.

Dr Bennett said most positively that the absence of the answers did not arise from their having been refused, but they were not among the papers which they had in their possession when they came to draw up their report, and he did not think it a matter of such importance as to write for them. He was quite willing to take the whole blame upon himself of their not being printed. He did not believe it was from any carelessness on the part of the Registrar.

Dr Andrew Wood expressed his satisfaction with Dr Bennett's explanation. He called the attention of the Council to the fact that the visitors had not mentioned whether the candidates were rejected or passed.

On Saturday, the visitation of the examination of the Faculty of Physicians and Surgeons of Glasgow was discussed. The question of operations on the dead body was discussed, and Dr Fleming promised to bring the subject before the Faculty. A somewhat warm discussion ensued, in which Dr Macnamara, Dr Quain, Sir Dominic Corrigan, and Dr Andrew Wood took part, about cases of students who, having failed in one examination, went quickly and passed another one.

The University of Glasgow and its examination furnished a text for discussion on the merits and demerits of the numerical mode of estimating a student's success. It gave Dr Thomson and Professor Turner the opportunity of expressing their views, to the latter especially of showing that the elevation of an M.B. to the M.D. was no mere form, but required the aspirant to provide a thesis of some value.

Sir William Gull opposed the numerical system. One of the questions in the examination papers of the University of Glasgow was, "Distinguish congestion from inflammation." Who could say whether the answer was worth seventy-five or fifty marks? Another question was, "With what object are emetics employed, in what circumstances are they contraindicated, and what evils are they liable to produce?" Who was to say with what object they are employed? The numbers given for the answer would depend upon the prejudice of the examiner. Again, if the question were asked, What is the treatment of typhoid fever? in proportion as the student was educated and the examiner ignorant, he would get nothing. He did not think it possible to lay down a standard of figures. One of the best men he ever educated at Guy's Hospital was placed at the bedside of a patient to examine the case. He was allowed half an hour to write out a clinical history, and one hour to write his comments upon it. The case was stated as one of hysterical paralysis. He wrote his history and comments most carefully, and made his diagnosis most perfectly, yet he was put into the second class, simply because of the ignorance of his examiner.

The visitation of the examination of the Royal College of Surgeons in Ireland brought out some amusing facts; that for one thing the examiners had completely forgotten there was going to be a visitation, that thus the examination in dissections was over; and, secondly, they had refused the visitor a copy of the answers of a successful candidate.

After some explanation by Dr Macnamara,

Dr Andrew Wood was very glad to gather from Dr Macnamara's concluding words that the Irish College of Surgeons—that infallible body, who alone were capable of judging of the qualifications of men—had resolved no longer to be recalcitrant, because he thought it was not fair to other bodies that the candidates' answers should be printed with all their imperfections, whilst an Irish college might say, "You may come and inspect our papers, but we will not preserve them, because our usage has been not to preserve them." He begged to call attention to a more serious complaint of the visitors, viz.:—"We felt that we ought not only to hear the answers read over by the candidate or the examiner, when only fifteen minutes is allowed both for considering their value, and for conducting the *vivâ voce* examination of each candidate," etc. If this meant that the oral examination of the candidate in anatomy, physiology, or any other subject, only lasted during the small portion of the fifteen minutes that remained after the examiners had considered the written answers, and that that was the whole time consumed in the examination of a gentleman who was to obtain the immaculate diploma of the Royal College of Surgeons, it was a very startling thing.

Sir William Gull thought that this was the most serious report which had come before them. The whole of the examination from beginning to end was as bad as could be. He then went through several passages, commenting upon them, and concluded by saying that he did not think that ever before had anything been brought to the attention of a council of medical men which so painfully showed the utter paltriness of an examination. Either the report was written in an extravagant way, or the examination was extravagantly imperfect. Feeling that it was something that called for special notice on the part of the Council, he moved as an amendment:—"That the Council has had its attention drawn to the many sources of imperfection in the examinations conducted for letters testimonial of the Royal College of Surgeons in Ireland, and trusts that the accompanying reports of the visitors at those examinations will receive serious attention on the part of the authorities of the Royal College; and that in any future visitation, the written papers of the candidates may be preserved and submitted without restriction to the visitors."

Part of the next two days was taken up with a long and somewhat acrimonious discussion as to the report of the visitation of the Queen's University of Ireland: on Wednesday, class examinations, and the question of the limitation of area of examinations, were discussed; and on Thursday, 16th, among other business, the following resolutions were passed by the Council:—

1. They recommended that in no case should the examination of a candidate in any subject by any of the licensing bodies be conducted wholly or in great part by the lecturer or teacher in that subject in the school in which the candidate has been educated;

and, 2. The Council next resolved, after some discussion, that it was desirable that the use of the microscope should form part of the examination of all candidates for a license.

On Friday the Executive Committee was elected. Tables showing the results of examinations were considered, and a long report regarding a scheme of conjoint examination for Ireland was tabled, and various questions were put, answered, or considered regarding names which should be removed from the register, etc.

On Saturday, after some observations by Mr Macnamara regarding the organization of the Royal College of Surgeons of Ireland, the report of the Pharmacopœia Committee was read, and, after some discussion, adopted on the whole. A discussion on the Examining Boards whose certificates were received for the preliminary examinations then took place, the Oxford and Cambridge Schools Examination Board being added to the previous list.

The Report of the Finance Committee was adopted.

Business then being over, Dr Paget left the chair, and

Dr Andrew Wood moved "That this Council cannot part with their late President, Dr Paget, without expresssing to him their great obligations for his services as their President, services which have been so ungrudgingly devoted, at large sacrifices to himself, for the good of the Council and the profession—for the uniform courteousness of his demeanour—for the impartiality of his decisions—for the discretion of his conduct in the chair—which have secured for him the esteem and affection of the members of the Council, and have conduced greatly to the efficiency of the action of the Council in raising the status of the medical profession."

Seconded by *Sir D. Corrigan*, and passed amid enthusiastic applause.

At this juncture the reporters were desired to retire. Dr Acland preceded them on their readmission, when Dr Stokes informed him that he had been elected President. Having taken the chair, he thanked the Council for the great honour conferred upon him. He regretted the retirement of Dr Paget. He spoke of the great services rendered the Council by Sir B. Brodie, Drs Green, Burrows, and now, the late President. He should not forget the responsible duties they had placed upon him. After sixteen years in connexion with them, and thirty years of public life, he should follow the footsteps of his predecessors.

Dr Smith proposed: "That the powers and duties heretofore delegated to the Executive Committee shall be vested in the said vCommittee until the next meeting of the General Medical Council."
sec*Dr Begbie* seconded this resolution. Passed.

a suc oved by Dr A. Smith, seconded by Dr Begbie, and agreed to:
Afte t the cordial thanks of this Council are due and are hereby
Dr A

tendered to Dr Andrew Wood, for his services as Chairman of the Business Committee during the present session of the Council."

Moved by Dr A. Smith, seconded by Dr Begbie, and agreed to: "That the thanks of the Council are due, and are hereby tendered, to the Treasurers, Dr Quain and Dr Bennett, for their important services."

After the transaction of a small amount of routine business, the Council adjourned.

MEDICAL HONOURS.—We are happy to be able to state that Dr J. Bell Pettigrew, F.R.S., whose lectures on the Physiology of the Circulation in Plants, in the Lower Animals, and in Man, recently appeared in our pages, is about to be awarded one of the prizes set apart by the French Academy of Sciences, Paris, for Physiological discoveries.

NAVAL MEDICAL DEPARTMENT.—Following close upon the influential deputation from the Parliamentary Bills Committee of the British Medical Association which waited upon the First Lord of the Admiralty on the 10th June, the medical officers of the Royal Navy have issued a succinct statement of "Suggestions and Reasons for Improving the Medical branch" of the Service, which, doubtless, many of our readers have seen. We would strongly direct the attention of those students who think of presenting themselves as candidates at the approaching examination, to the unfavourable position, which, in the opinion of the deputation and others, deters many young men from entering the Navy, and renders those who are already in it discontented and unhappy. For years past, few English or Scotch students have thought of going up, so unpopular has the Navy been in the Schools on this side of the Channel; and it is now understood that at last Irish students are holding back. Unfortunately, it is said, there is at least one influential member of the Board of Admiralty who is no friend of "the doctors;" and it is currently believed that their Lordships and the Medical Director-General, whose recent re-appointment for five years seems to have given rise to much dissatisfaction in the service, do not pull well together on the question. But if it should be the case that candidates from Ireland fail to appear at the forthcoming examination, "My Lords" will probably be compelled, however reluctantly, to redress the grievances complained of. Already, we believe, there are between forty and fifty vacancies to be filled up.

CHAIR OF PHYSIOLOGY.—For the Chair of Physiology in the University of Edinburgh, soon to be vacant by the resignation of

Dr Hughes Bennett, who for so many years has been a chief pillar in the School, there are already four candidates, any one of whom would admirably fill the vacancy:—Professor Cleland of Galway, a well-known Anatomist and Physiologist; Dr M'Kendrick, who has filled the Chair so well in Professor Bennett's absence during the last three years, and who has already made himself a name for original physiological work; Dr Pettigrew, well known for his researches on the Anatomy of the Heart and the Mechanism of Flight; and Professor Rutherford of King's College, whose ability as a Lecturer on Physiology is known far beyond his own College.

CORRESPONDENCE.

TREATMENT OF EXOSTOSIS BY SUBCUTANEOUS FRACTURE.

To the Editor of the Edinburgh Medical Journal.

My attention has been called to, and I have read with much interest, the account by Dr Chiene in the Edinburgh Medical Journal for this month, of a case in which an exostosis, having been accidentally broken off, became ultimately absorbed and disappeared. I am the more interested in the fact, because, having admitted into my wards on the 23d of June a patient the subject of a long outgrowth, I then discussed the possible methods of treatment—subcutaneous fracture; subcutaneous section by chisel and mallet; or, free incision. When the patient was under the influence of chloroform, I was able to determine that the globular head of the growth was attached by a slender stem to the outside and back part of the femur, near to the knee-joint. I decided to try to fracture this pedicle, and did so with comparative ease with a large pair of pliers, and with a *jerk*, the skin being protected by a piece of chamois leather. My first idea was to strike the growth laterally with a hammer. I operated on 8th July, the operation having been postponed a fortnight; first, in order that the patient might keep her bed for a week and become acclimatized; and, secondly, that she might recover from an attack of catarrh which she had contracted while in hospital.

During the forty-eight hours subsequent to operation, a little swelling and ecchymosis appeared; but on the following day these symptoms were slowly subsiding.

Probably many questions for consideration will arise out of this case, but they will be more profitably discussed when the result of the operation is known, a few months hence.

C. F. MAUNDER,
Surgeon to the London Hospital.

16 Queen Anne Street, London,
16*th July* 1874.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Clinical Lectures on Diseases of the Heart.* By GEORGE W. BALFOUR, M.D., F.R.C.P. Ed., Physician to the Royal Infirmary.

On Incompetency of the Aortic Valves.

GENTLEMEN,—There is no disease of the heart, of common occurrence, which possesses so many elements of interest as aortic incompetency, whether we regard its pathology in relation to the various causes which may give rise to it, to the concomitant morbid alterations in the aorta, in the heart itself, and in the circulation, which are so various and sometimes so diverse; or whether we regard its diagnosis, which, to be accurate, involves a careful discrimination of the causes of the incompetence, and of the consecutive changes in the heart itself, whether these be the direct or the indirect result of the primary lesion, and upon a due appreciation of which both the prognosis and the treatment largely depend.

In aortic incompetence, as well as in all cardiac diseases, all our information is derived from the state of the pulse, and from the inspection, palpation, percussion, and auscultation of the patient; and a due consideration of these phenomena enables us to predict with considerable certainty the exact condition of the aortic valves, and to determine the degree in which the persistence of this condition has influenced the walls of the heart as well as the circulation generally. Confining our attention for the present to the auscultation of the patient, you are aware that the murmur indicative of aortic incompetence is a diastolic murmur of a more or less soft and blowing character, audible, as is usually said, at the base of the heart. But this is by no means always the case. Sometimes the murmur is only audible, and that but faintly, just below the aortic valves at midsternum, a little beneath the level of the fourth rib. Very rarely, it is loudest at the left apex;[1] very frequently it is loudest and sometimes only to be heard—except in the arteries—at the ensiform cartilage, or more nearly in the position of the right apex; at times it is loud and distinctly audible over every part of the cardiac area, and then it is also audible in every part of the arterial system to which the stethoscope has access; while at still other times it is inaudible above the level of the aortic valves, and is not perceptible in any artery. I have already mentioned[1] that murmurs are with great probability believed to be produced by the formation at any point of a liquid vein in the blood-current, and an instant's reflection will show us that the same cause which is capable of producing a liquid vein at the aortic orifice during the diastole of the heart must in most instances be equally potent during its systole; hence we have in such cases almost always a double murmur, *bruit de va et vien*, a see-saw murmur, of which the first systolic portion is always rough, the second, or diastolic portion, always soft and blowing, though sometimes the one and sometimes the other may be loudest; while the propagation of the systolic portion of the murmur is subject to apparently similar vagaries with that of the diastolic portion, being at one time audible over all the cardiac area, at another time only audible at and above the aortic orifice, and again chiefly audible only in the arteries. The term double aortic lesion is therefore a common and by no means inapplicable designation for that affection of which incompetence of the aortic valves forms always the most distinctive and rarely the sole important feature. Nor are the variations in the manner in which the constituents of this double murmur are propagated mere vagaries in the conduction of sound; they are important facts depending upon physical causes, and convey most momentous information to the understanding of the physician whose ear perceives them.

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[1] This position of maximum intensity of the murmur of aortic incompetence is only found in cases of accidental rupture of the posterior aortic segment of the semilunar valve.—Vide Dr Balthazar Foster's Essays on Clinical Medicine, London, Churchill, 1874, p. 121.

The following cases have been selected for the purpose of exhibiting the chief important varieties of aortic regurgitation, and the manner in which the condition of the valves in each variety influences the production and the propagation of the murmurs:—

CASE I.—Janet M'Gowan,[2] aged 22, admitted, 25th March 1874, to bed 2, Ward XIII., complaining of subacute wandering pains in her joints. This attack commenced twelve months ago, and was at first accompanied by great pain and some swelling in the region of the heart, for which a fly-blister was prescribed, after which the swelling disappeared and the pain subsided, but it has not altogether ceased. Three years and a half ago she had an attack of rheumatic fever, but apart from that has always enjoyed good health, excepting suffering from measles and scarlet fever when a child. The patient is well developed; expression natural; integuments moist; temperature 98·6°; limbs somewhat wasted; joints noways deformed, but occasionally painful, chiefly the shoulder and elbow joints; no anasarca; arteries and veins normal on inspection; pulse 73, slightly jerking, but this is not perceptibly increased on elevating the arm at right angles to the body as the patient lies in bed. On percussion, the cardiac dulness at one inch to the left of the sternum extends vertically from the upper border of the third rib till it meets with the tympanitic resonance of the stomach, and extends in the line of the fourth rib from three-quarters of an inch to the right of the sternum transversely across the chest for a distance of four inches and three-quarters. The apex beats firm and full between the fifth and sixth ribs, two inches and three-quarters to the left of the sternum. On auscultation in the mitral area, the first sound is heard loud, thumping, and accompanied by a systolic murmur; no diastolic sound or murmur audible. In the tricuspid area the first sound is loud, distinct, still somewhat thumping, and accompanied by a systolic murmur, followed by an equally distinct diastolic one. Above the fourth rib the thumping character of the first sound is lost, while the systolic murmur increases in intensity. In the aortic area neither systolic nor diastolic sound is audible, but instead there is a very loud and distinct double murmur, the systolic portion of which is extremely rough, and propagated with great distinctness into the carotid arteries, the diastolic murmur being in them inaudible. In the pulmonary area a double murmur is heard, the systolic portion of which completely replaces the first sound, while the diastolic portion partially obscures an accentuated second sound. Her respirations are 32 in a minute; no cough, and no dyspnœa, except on exertion, and then not to any great amount; pulmonary physical signs normal; nervous system normal; appetite defective; bowels regular; urine normal, specific gravity 1015; menstruation regular till twelve months ago; since then, irregular. On 15th May it is noted that a well-marked presystolic murmur has become developed, and this continued till the patient was sent to the Convalescent Hospital on 20th May, completely relieved of all her rheumatic symptoms.

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[1] Vide Edinburgh Medical Journal, June 1874, p. 1086.

[2] Condensed from the notes of Mr J. H. Clarke, clinical clerk.

This patient, you will observe, came under treatment solely for her subacute rheumatic affection, and though labouring under serious cardiac disease, which will undoubtedly shorten her days, this has been so completely compensated as to be altogether mute. The dilatation and hypertrophy of the left ventricle quite counterbalanced each other, and both together were just sufficient to compensate the existing regurgitation through the incompetent aortic valves. For the present I omit as irrelevant all reference to the state of the mitral valve, and shall direct your attention solely to the aortic murmurs and their mode of propagation. You will observe that the systolic murmur, more or less audible over the whole cardiac area, has its position of maximum intensity in the aortic area, and is therefore clearly of aortic origin. It depends, therefore, upon some abnormal alteration of the aortic orifice capable of producing a fluid vein, and so giving rise to an audible murmur. Now, the essential element in the production of a fluid vein is some abnormal relation between the part where the blood comes from and that into which it flows—in this case, the ventricle and the aorta—and to produce a fluid vein the latter must be really or comparatively dilated. There is in this case no evidence of any real dilatation of the aorta—no increase of dulness over the upper part of the sternum, no pulsation in the tracheal fossa. Have we any reason to suspect the existence of a comparative dilatation, that is, of an obstruction at the orifice, and what is its nature? The answer to this question is easy. From the history of this patient we have every reason to conclude that she has had pericardiac inflammation, as proved by the swelling and pain in the precordial region in the early period of her rheumatic attack, while the thumping first sound, and subsequently developed presystolic murmur, along with the more or less constant cardiac pain, conclusively prove that this has been associated with a more or less chronic endocarditis, which has stiffened and deformed the mitral valve, and which may very possibly have had the same effect upon the aortic semilunar valves, the result of which would be to present an obstruction to the onward current of the blood, to produce a relative dilatation of the aorta, and so give rise to a systolic fluid vein and concomitant murmur, rough in proportion to the ventricular force employed in expelling the blood, and to the degree of obstruction existing, which, in accordance with the laws of sound, would be carried most distinctly onwards with the blood-current into the carotids, while it also propagated with greater or less distinctness, according to circumstances, in other directions. The history of this case is therefore in complete accordance with this portion of the auscultatory phenomena, and renders this explanation probable in the very highest degree. But if the aortic semilunar valves are so thickened and crumpled as to produce obstruction to the onward flow of the blood, they can hardly be expected to be also competent. They may be so, but only very rarely. Most usually they are more or less incompetent; and then the same cause which gave rise to a fluid vein and a murmur during the systolic outflow of the blood from the ventricle must likewise produce a fluid vein, and consequently a murmur, during the diastolic regurgitation of the blood from the aorta into the ventricle, the diastolic murmur being of course softer than the systolic one, because the forces expelling the blood from the artery are so much less than the contractive force of the left ventricle; and this has been the case in this instance. We are scarcely yet in a position to state in every case why a diastolic murmur originating at the orifice of the aorta should at one time be heard loudest above that part, as in the so-called aortic area, and at another lower down the sternum. At present we can only state it as a fact, and indicate the strong probability there is that, in some cases at all events, it will ultimately be found to be connected with the nature of the obstruction; and the comparative readiness, therefore, with which the vibrations of the fluid vein are propagated outwards through the walls of the vessel, on the one hand, or downwards with the current of the blood, on the other. In all probability the greater the obstruction, and the more vibratile its structure, either in itself or in its connexion with the arterial walls, the more the murmur will be localized in the aortic area; while the less the obstruction, and the less vibratile its structure or connexions, the more the murmur will tend to be propagated downwards in the direction of the blood-current, or possibly it may be solely produced at that part of the heart on which the vein impinges, propagation in other directions ensuing in all cases in accordance with the known laws of sound. These reasons have at least probability on their side, and you will find that the more we examine into the various forms of aortic incompetence, the greater will this probability appear. At present we are dealing with a case in which both the systolic and diastolic murmurs are most distinct in the aortic area. The incompetence of the aortic valves is not great—1st, Because the apex beats in its normal plane, though a little outside of its normal position; the heart has more of the purse shape usual in mitral disease than of the conoid form, due to dilatation of the left ventricle, which is so common in aortic incompetence. 2d, Because there is but little of the jerking character to be felt in the pulse, or seen in the carotid and brachial arteries, so distinctive of disease of the aortic valves. The absence of this is of course not due in this case, as it sometimes is, to debility of the ventricular walls, because the apex beat of this heart is firm and forcible, but obviously to the absence of any great dilatation of the left ventricle, and, as an ultimate cause, to the absence of any great aortic incompetence. 3d, Because the diastolic murmur is quite inaudible in the carotid as well as in the crural arteries, while it is so loud at the base of the heart. We shall presently see that a diastolic murmur may be audible in the arteries and inaudible at the base of the heart; that in this latter case it is associated with all the signs and symptoms of great valvular incompetence; while in our present case the signs and symptoms are the very reverse. For these reasons, therefore, there are the strongest grounds for believing that in this case we have to do with—confining our attention to the aortic valves—a stiffened and somewhat shrivelled condition of these valves, due to rheumatism. These valves are also atheromatous, or covered with dense vegetation, possibly both, and are only slightly incompetent, the mitral lesion being comparatively unimportant, though its coexistence necessarily renders the prognosis more grave.

The following example exhibits how these murmurs of aortic incompetence vary even in cases which are otherwise similar, showing, also, how all such variation is probably due to slight alteration in the physical causes, which we only want a larger and more accurate experience to enable us to interpret correctly.

CASE II.—Mary Anderson,[1] married, a laundress, aged 31, admitted to Ward XIII., 3d December 1872, complaining of severe pain in the region of the heart, a choking sensation in the throat, a troublesome cough and spit, and complete loss of sleep. Nine years ago, she suffered from a sharp attack of rheumatic fever, lasting eight weeks, six of which were passed in hospital. At this time she had severe pain in the region of the heart, both in front and behind, accompanied by palpitation. A fortnight after dismissal, she was able to return to her work. A similar but less severe attack has recurred every winter since that time. The present attack commenced eight weeks ago with severe pain in the cardiac region, with swelling of the legs, choking sensation in the throat, which did not interfere with swallowing; atonic dyspepsia, relieved temporarily by occasional vomiting after food; and gradual diminution in the amount of urine passed. Patient's family history is good. She has two children, both alive and healthy. Her face is somewhat livid, her fingers slightly clubbed, her legs œdematous, the joints normal, temperature 99°, sensation and intelligence normal; has slept well the two nights following admission; pulse 112, irregular, somewhat forcible, and felt to be distinctly jerking on elevating the arm at right angles to the body as she lies in bed. Considerable pulsation is visible at the root of the neck, both in the carotids and in the tracheal fossa. No venous pulsation is observable. The apex beats somewhat forcibly between the sixth and seventh ribs, about three and a half inches from the left edge of the sternum. In the parasternal line, one inch from the left edge of the sternum, dulness begins at the upper border of the second rib, and extends down to the liver dulness. Transverse dulness in the line of the fourth rib commences at three-quarters of an inch to the right of the sternum, and extends across for four and three-quarter inches. On listening over the apex beat, a slight thump is heard, forming as it were the first portion of the first sound, which is obscured by a bruit. The second sound in this area is replaced by a soft diastolic murmur. In the tricuspid area, the first sound is quite audible, the obscuring bruit being, however, louder than in the mitral area, the diastolic murmur being still soft, but also more distinct than in the mitral area. In the aortic area, the first sound, audible in both the mitral and tricuspid areas, is completely replaced by the systolic bruit, which is loud and rough, and attains its maximum intensity in this position; the second sound is wholly wanting, being replaced by a soft, low, but distinct diastolic murmur, the position of maximum intensity of which is at midsternum, just below the fourth rib. In the pulmonary area, the first sound is wholly replaced by a loud systolic murmur; while the second is heard loudly accentuated, but somewhat obscured by the diastolic murmur propagated across from the aortic area. In the carotid and femoral arteries, a loud systolic murmur alone is heard, the diastolic

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[1] From the notes of Mr O'Connor, clinical clerk.

murmur being inaudible. Her respirations are 32 in a minute. She has a sharp, harsh cough, accompanied by slight watery expectoration. Pulmonary percussion everywhere normal. Auscultation reveals crepitation over both lungs anteriorly; posteriorly, this is mingled with occasional rhonchi. Tongue clean, but red and raw-looking at its tip. There is great craving for food, some flatulent distension of the stomach, especially after eating; bowels irregular; liver dulness normal. Patient has not menstruated for twelve months. Her urine varies from 36 to 52 oz., of a clear straw colour, with a trace of albumen on admission, which has since disappeared.

Diagnosis.—The history of this patient is that of rheumatic fever, accompanied by an affection of the heart, which inspection, palpation, and percussion agree in showing has resulted in dilatation of the heart, particularly of its right auricle and left ventricle, with some hypertrophy of the latter. The slight thump forming the first portion of the first sound is well known to be the last remaining vestige of a presystolic murmur, quite as distinctive to an ear accustomed to recognise it as a well-marked auriculo-systolic murmur, and equally with it a sign upon which it is safe to rely with the utmost confidence as significant of constriction of the auriculo-ventricular opening—one of the most common results of a cardiac rheumatic affection, and which of itself is capable of explaining the pulmonary congestion and œdema, revealed by the cough, the watery expectoration, and the accentuated pulmonary second, but which, in the absence of any serious implication of the right side of the heart—as shown by the presence of the tricuspid first sound, and the absence of any great pulsation at the lower end of the sternum or in the jugular veins—is incapable of accounting for the great interference with the systemic circulation shown by the livid countenance, œdema of the lower extremities, slight albuminuria, and flatulent dyspepsia; neither could this constriction give rise to the dilatation of the left ventricle which undoubtedly exists. But, on the other hand, we have in the loud systolic murmur, with its positions of maximum intensity in the aortic area, and which is distinctly propagated into the arteries, sufficient proof that the same disease which has deformed the mitral valve has also altered, thickened, and stiffened the aortic valves, while the diastolic murmur which has replaced the aortic second sound shows that the crumpling and stiffening of the aortic valves, which is great enough to retain them as a considerable and permanent obstacle to the egress of the blood, is also sufficient to prevent them closing with that tension necessary to the production of a diastolic sound, and has rendered them incompetent. This incompetence, however, though sufficient to produce a murmur at and below the situation of the aortic valves, is so trifling as to have but a very slight influence on the arterial circulation, and is therefore not audible in the carotid arteries, and is only carried up to the so-called aortic area, by propagation through the sternum, while it is carried downwards to a greater extent, as in conveying it in that direction the influence of the blood-current coincides with that of the sternum. So trifling an incompetence of the aortic valves would, in ordinary circumstances, be readily compensated, but in the present case it greatly intensifies the evil influence of the existing mitral constriction, and both together form an obstruction to the onward flow of the blood, quite sufficient to account for all the serious symptoms which exist, and also to render the prognosis very grave in this patient, who has been so greatly enfeebled by her repeated rheumatic attacks.

The patient was treated with nourishing unstimulating diet—with half-ounce doses of the infusion of digitalis and five grains of carbonate of ammonia thrice a day, and fifteen grains of chloral at bed-time, to allay her cough and cardiac pain and procure sleep. At first she progressed favourably, but towards the end of December (21st) she began to complain of pains in her joints, increased œdema of her legs, and considerable pain over her stomach and liver, the latter now commencing to enlarge and become tender to touch.

She now had given her ten minims of the tincture of digitalis, with five of the liquor arsenicalis and of the tincture of the perchloride of iron, thrice a day. She gradually became worse, however, and in the beginning of January diarrhœa set in. This was kept in check by appropriate treatment, but the pain in the chest, the breathlessness, and pain over the liver continued, and she died at 1 A.M. on the 15th of January 1873.

Autopsy.[1]—Jan. 17. Heart considerably enlarged; mitral valve constricted, admitting only one finger; aortic valves atheromatous, the cusps covered with vegetations. Several hæmorrhagic infarctions in the lungs, which are otherwise healthy. Liver weighs 4 lbs. 14 oz., is of firm consistence, slightly hypertrophied, and exhibits all the characteristics of extreme chronic congestion. Spleen weighs 11 oz., firm and congested. Kidneys are slightly congested, and exhibit several depressions, the results of previous infarctions; the right weighs 6½ oz., and the left 5½ oz. Other results unimportant.

These two cases, then, exhibit the character of the murmurs, and the manner of their propagation in those whose aortic valves are somewhat crumpled, thickened, and atheromatous, mainly as the result of rheumatism. Such valves cannot move out of the way, they therefore present a considerable obstacle to the egress of the blood, and this results in the production of a loud systolic murmur, always very audible in the carotid arteries, and which may occasionally be heard throughout the arterial system. As these valves move but little out of the way of the cardiac systolic current, they have no distance to fall during the cardiac diastole; therefore, so far as they do close at this time, this closure is not forcible; and the cusps being no longer membranous, every source of tensile vibration is almost completely cut off, and there is no trace of an aortic second sound to be heard. We must be careful to remember that the absence of a second sound in such cases does not arise from the completeness of the destruction of the valves, because they are still present, and frequently occupy even a larger space of the aortic orifice than they do in other cases where an aortic sound is audible; neither is it because the second sound is obscured by the diastolic murmur. This might be the case, as when the valves are in a different condition a second sound and a diastolic murmur, originating at the same orifice, are frequently to be heard together; in cases such as the present, however, the absence of a second sound is solely to be attributed to the immobility and absence of membranous elasticity in the valves themselves. On the other hand, the deformity of the aortic valves prevents them from closing perfectly, and permits of regurgitation proportionate to that imperfection; as this is seldom great, the diastolic murmur to which it gives rise, however loud it may be, is never propagated into the carotid arteries. It may be heard all over the cardiac area, propagated chiefly through the bones, the sternum acting as a sounding-board; but it is chiefly heard about midsternum, just below the fourth rib, and is under all circumstances propagated downwards with most distinctness; the essence of the physical signs quoad the murmurs being in such cases the loudness of the systolic murmur in the aortic area and its ready propagation into the carotids, while the position of maximum intensity of the diastolic murmur is just over the aortic valves, or immediately below them, and it is never propagated into the carotids, or only in the faintest possible murmur.

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[1] From the Pathological Records of the Royal Infirmary. Weight of heart not recorded.

The next case which I shall relate presents phenomena which are exactly the reverse of these, and indicate of course a different character of lesion.

Case III.—James Bailey,[1] aged 35, unmarried, a labourer residing in Leith, was admitted to bed 2, Ward V., on 19th February 1874, complaining of a severe cold, continuous cough, and pain in the epigastrium. The patient says that he has been short of breath as long as he can remember, and he thinks this has got worse as he grew older. Twenty years ago he had fever (probably typhus), for which he was treated in this Infirmary. Nine years ago he was under treatment in this Infirmary for one month on account of rheumatic fever; during this illness he was delirious for two or three nights. About three years ago he was again in this Infirmary for a less severe attack of rheumatism. He has always been well fed, comfortably housed and clothed, but his occupation necessitates constant exposure to all kinds of weather. About three weeks ago he was more than usually exposed to severe weather, and except his dyspnœa, all his ailments date from this time. Patient is fairly developed, height 5 feet, weight 8 stone 9 lbs., muscularity good. He usually sleeps on his left side, but is often obliged to sit up in bed for a time on account of his dyspnœa. Expression of his face is normal, integument normal, temperature 98°, limbs and joints natural; pulse 75 per minute, full, jerking, and delayed about half a pulsation behind the apex beat; very evident and distinct pulsation is to be seen in both carotids and in both brachials. On inspection, the apex is seen to beat with tolerable distinctness in the seventh intercostal space, five inches to the left of the xyphoid cartilage; from this an undulatory pulsation is diffused up to the fourth rib, the most remarkable part of which is a systolic depression, greatest between the fifth and sixth ribs. In the scrobiculus cordis, a slight pulsation is distinctly visible, and this is seen to be communicated to the entire hepatic region. On palpation the diffused apex beat is felt to extend over some inches; it, as well as the whole left ventricle, communicates a heaving but not forcible impulse to the hand. In the parasternal line, dulness commences at the third interspace and extends downwards to the liver dulness; at the level of the fourth rib, the transverse dulness extends from half an inch to the right of the sternum to half an inch beyond the left nipple, a distance of six inches and a half. On auscultation in the mitral area, the first sound is heard obscure and impure, but without distinct murmur; the second sound is heard obscured by a diastolic murmur. In the tricuspid area, the first sound is much more clear and distinct than over the mitral area, no second sound is audible, it being completely replaced by a loud and well-marked but soft diastolic murmur. In the aortic area, the first sound is obscurely heard, much as at the apex, and without evident murmur; the second sound is replaced by a distinct diastolic murmur. In the pulmonary area, the first sound is impure; the second sound accentuated, but obscured by the diastolic murmur. The diastolic murmur is heard over every part of the chest, but is loudest over the sternum, just beneath the aortic valves; it is even audible over the chest posteriorly; in the carotid and femoral arteries, a well-marked and distinct double murmur is readily heard. The percussion of the lungs is everywhere normal, but on auscultation a good many rhonchi and crepitant rattles are heard distributed over them. Liver dulness is normal; and except some flatulent atonic dyspepsia, there is nothing else of importance about the patient. Bailey continued gradually to improve under treatment till 14th April, when he was discharged. Since then he has written from Ireland to say that he has given up all remedies, and feels quite well. The treatment consisted mainly in the continuous and regulated administration of digitalis, at first in the form of ℥ss. doses of the infusion, with five grains of carbonate of ammonia thrice a day; latterly the tincture was given, with iron and arsenic. Apart from the lung symptoms, which were mainly due to a severe catarrh, aggravated by the continuous pulmonic congestion maintained by the aortic insufficiency, the remarkable facts in this case were, *1st*, The great dilatation and hypertrophy of the left ventricle, revealed by the low situation of the true apex, which beat beneath the edge of the eighth rib; the general slow heaving impulse of the ventricle, and the systolic dimpling of the surface over the left ventricle, the latter being evidently due to displacement of the lung, and the pressure of the atmosphere upon the walls of the chest during the systolic recession of the enlarged ventricle. *2d*, The absence of any special implication of the right heart, notwithstanding the great amount of disease on the left side. *3d*, The impurity of the mitral sound, obviously depending upon some slight rheumatic alteration of the mitral valve. *4th*, The absence of a marked systolic murmur from the aortic area. *5th*, The loud diastolic murmur, audible over all the cardiac area, beneath the level of the aortic orifice. *6th*, The markedly distinct character of both murmurs in all the arteries, and specially in the carotid and femoral arteries. The absence of any distinct systolic murmur from the aortic area indicates the absence of any well-marked obstruction at the aortic orifice; indicates, therefore, the preponderance of retraction or crumpling, or it may be of ulceration over calcification of the valves, and this accounts for the amount of diastolic regurgitation revealed by the great collapse of the pulse, the distinctness of the diastolic arterial murmur, and to some extent also accounts for the distinctness of the diastolic murmur over the cardiac area; that, however, depends partly on the condition of the remaining portion of the valves, and the degree in which they are capable of originating fluid veins, though, no doubt, the force of the regurgitating current —which must be greater the more complete the regurgitation is— must have its influence in rendering these fluid veins more sonorous, while the condition of the sternum, and its connexion with the ribs, has its influence in propagating the murmur over the chest. The points to which I wish specially to direct your attention at present are, the specialities of the aortic murmur, viz., the absence of a systolic murmur from the aortic area, and the presence of a well-marked double murmur in the arteries. I have already stated that the absence of the systolic murmur from the aortic area is due to the almost entire absence of any obstruction at its orifice; some degree of obstruction there must be, however, and to that as well as to the same cause which makes the carotid murmur so distinct, it is due that in the innominate artery this murmur is more distinct than at the aortic area, though it falls very far short of that which is audible in the carotid artery, where the stethoscope, by compressing the artery, gives rise to a fluid vein which increases and intensifies the systolic portion of the murmur. This systolic arterial murmur, though intensified by compression of the artery, is quite audible without this, even when we place the stethoscope only in the immediate neighbourhood of the artery;

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[1] From the notes of Mr A. Field, clinical clerk.

because, though partly due to the formation of fluid veins, it owes its existence much more to the fact that the greatly dilated and hypertrophous left ventricle sends forward a wave of blood disproportionate to the calibre of the arteries, and consequently we have in the carotid arteries, at the moment of the ventricular systole, a loud murmur composed partly of that produced by the fluid veins originating at the aortic orifice, but also, in a much greater measure, by the vibrations caused by the sudden tension produced in the arterial coats. We see, then, that a loud systolic murmur may be audible in the arteries in two very different conditions of the aortic orifice: where there is much obstruction from calcified valves, the systolic murmur is loudest at the aortic orifice and is propagated into the arteries, gradually diminishing in intensity as we recede from the heart; where there is great destruction of the valves, and consequently but little obstruction, the systolic murmur is always less audible over the aortic orifice than over the arteries, and the diminution of the murmur on receding from the heart is not so great. In both cases the rhythm of the murmur alters as we approach the periphery, being always in unison with the rhythm of the pulse, and not with that of the heart, so that a ventriculo-systolic murmur in the carotids may become ventriculo-diastolic when it reaches the radial or femoral arteries; or if it still remain ventriculo-systolic, then the cardiac systole is that of the pulsation immediately succeeding that which originates the murmur, as we may ascertain by tracing it down the arteries. The diastolic murmur, however, which in the carotids immediately follows the ventriculo-systolic murmur, and which in every part of the arterial system is synchronous with the arterial systole, whatever relation that may have to the cardiac diastole, has but one origin, viz., free regurgitation into the ventricle; it is inaudible unless we compress the artery with the stethoscope so as to produce a fluid vein at that point; and there it is always to be heard with greater or less ease, according to the amount of regurgitation present. The readiness with which we hear this ventriculo-diastolic murmur in the arteries may be accepted as a measure of the freedom of regurgitation into the ventricle, but its absence is by no means to be regarded as a proof that no regurgitation is present, as, where much obstruction exists, this murmur may be quite inaudible above the aortic valves. Thus, I agree with Jaccoud[1] when he states that, on placing the stethoscope lightly over an artery at the moment of its diastole, only a slight membranous click is heard in the normal condition synchronous with its sudden expansion; a stronger pressure may increase this sound, but produces no murmur. When the artery is forcibly dilated by the large blood-wave coming from a dilated hypertrophous ventricle, the very slightest pressure converts this membranous sound into a loud systolic murmur; should this be associated, as it usually is, with free regurgitation, a similar pressure brings out clearly enough a soft diastolic murmur, succeeding the systolic one, while a still stronger pressure extinguishes all murmurs and all pulsation. I agree also with Duroziez[1] in thinking this double arterial murmur to be in a great measure an artificially produced phenomenon—one certainly, the elements of which naturally exist in all suitable cases, but which can only be rendered audible artificially; but I differ entirely from him in his estimate of it as a phenomenon of importance in the diagnosis of aortic incompetence. In one respect I go further than Duroziez, for I have no hesitation in stating that a true ventriculo-diastolic murmur audible in the arteries is never heard except when aortic incompetence exists;[2] but I have equally little hesitation in stating that aortic incompetence exists in many cases in which no such murmur is audible. Traube[3] believes that when aortic regurgitation is extreme, we can hear in the femoral arteries a double sound—not a double murmur—which originates spontaneously in the artery itself, without the intervention of the observer: the systolic sound arising from the vibrations produced in the arterial walls by their great and sudden distension, the diastolic sound being caused by the vibration produced by their equally sudden relaxation. What he has called a systolic sound I have called a murmur, because it is an unnatural phenomenon. All murmurs may be called sounds, but only those audible phenomena which are produced in the natural condition of the heart and bloodvessels ought, in the phraseology having reference to cardiac physiology and diagnosis, to receive that name. When Traube, however, speaks of a diastolic sound to be heard in the arteries, audible without any intervention of the observer, and due solely to the vibrations produced by the *sudden relaxation* of the arterial coats, he speaks not only of a phenomenon I have never heard, but of one which there is no physical reason for supposing can ever be produced.

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[1] Leçons de Clinique Medicale, Paris, 1869, p. 185.

In the normal condition of the heart and bloodvessels, it is generally supposed that cardiac pulsation is arrested by the capillaries, but this is by no means always the case; and even in the normal condition, the cardiac pulsation is occasionally propagated not only into the capillaries, but also into the veins, as was first recorded by Quincke. Hence a capillary or venous pulse—and in this case of course I speak of a direct venous pulse, and not of jugular regurgitation—though frequently seen in many cases of aortic disease, both in such parts as are in their natural condition, as in the cheeks, nails, and retina, and also in inflamed or erysipelatous parts, and very likely to be regarded as a measure of the amount of regurgitation present, is by no means a pathognomonic phenomenon, nor even one of diagnostic importance, but, so far as at present appears, simply a physiological curiosity.[1]

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[1] Du Double Souffle Crural comme signe de l'Insuffisance Aortique.—Archives Général de Médecine, April 1, 1861.

[2] Duroziez says that this double murmur is also heard in cases of enteric fever, chlorosis, and lead-poisoning.

[3] Gessammelte Beiträge zur Pathologie und Physiologie, Berlin, 1871, Bd. i. p. 793; and Berliner Klinische Wochenschrift, 1872, No. 48, p. 573.

The next case is the last one I shall comment upon at present, and I bring it before you now, simply as an illustration of a third form in which the murmurs of aortic incompetence may occur.

CASE IV.—Matthew Murray, a police-officer, aged 39, admitted to bed 7, Ward V., on 19th March 1874, complaining of pain in the chest and breathlessness, from which he has suffered greatly since last October. He was originally a farm-servant, but has been in the police force for eleven years and a half. He is 5 feet 9 inches in height, stout and healthy-looking; has always been sober, well fed, clothed, and housed, and has never suffered from any serious disease—in particular, has never had rheumatism; seven years ago had sores on his penis, but they were not followed by any sore throat or eruption, etc. In his earlier days he was in the habit of making violent and laborious exertions; latterly, he has not. Has never been in the army, and cross belts on the chest form no part of his official costume. About seven years ago, he received a severe blow on the chest from one of the shafts of a lorry while trying to stop a runaway horse. On inspection, marked pulsation is visible, both in the carotid and brachial arteries; the cardiac pulsation is defective, apex beat not noticeable, slight pulsation in the scrobiculus cordis; both pupils are normal; on palpation, the radial pulses are found both equal, jerking with a well-marked thrill, and beating 75 per minute. The thrill is not so perceptible in the carotid as in the brachial and radial arteries. The jerking character of the pulse is markedly increased on elevating the arm above the patient's head as he sits. The cardiac apex is scarcely to be felt; it beats between the fifth and sixth ribs, three inches and a half from the left edge of the sternum. The cardiac pulsation is generally defective. On percussion in the parasternal line, the dulness commences at the upper edge of the third rib and extends down to the liver dulness. Transversely in the line of the fourth rib, dulness commences half an inch from the right edge of the sternum, and extends across for a distance of six inches. On auscultation in the mitral area, the first sound is heard obscured by a systolic murmur, which, on being traced up to the aortic area, is found to have its position of maximum intensity there. This murmur is audible over all the cardiac area, obscuring the first sound in the mitral, tricuspid, and pulmonary areas, and replacing it completely in the aortic area. In the pulmonary area an accentuated second sound is faintly heard greatly obscured by a diastolic murmur, which replaces the second sound in all the other areas, and is loudest in the aortic area. This double murmur is more or less audible over all the chest, both before and behind, but has its position of maximum intensity in the aortic area. The aortic dulness reaches to within one inch and a quarter of the top of the sternum. A distinct double murmur is heard in the carotid and femoral arteries. Dyspnœa and cough are chiefly remarkable when the patient lies down at night. Pulmonary percussion normal over the left lung, slightly higher (emptier) over the right lung, especially over its lower lobe. Pulmonary auscultation normal over the left lung; over the right lung the vesicular murmur is weakened, especially over the lower lobe. In other respects the patient is normal.

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[1] Vide Mr T. William King, Guy's Hospital Reports, Nos. iv. and xii. Stokes on Diseases of the Heart and Aorta, Dublin, 1854, p. 202. Lebert, Handbuch der Practischen Medicin, Tübingen, 1862, vol. i. p. 725. Quincke, Beobachtungen über Capillär- and Venenpuls, Berliner Klinische Wochenschrift, 1868, No. 34, p. 357. Grandclement, De la Valeur des Battements de l'Artère Centrale de la Retine, dans les Affections Cardiaques, Lyon Medical, 1874, No. 12, p. 136.

After what has been already said, this case requires little explanation. The extent of the transverse dulness might lead to the supposition of considerable dilatation of the right side, but the trifling character of the impulse in the scrobiculus cordis is against this idea. Again, the very free regurgitation through the aortic valves is opposed to the idea of the impulse between the fifth and sixth ribs being that of the true apex; while the very considerable force of the blood-wave, as perceived in the arteries, is also opposed to the idea of the very defective ventricular impulse being a true measure of the condition of the cardiac walls. We are therefore forced to the conclusion that the great breadth of the cardiac dulness is due to the oblique position of the heart, which lies more transversely and also deeper than usual, the defective impulse being due more to the increased depth of lung covering it than to any preponderance of dilatation over hypertrophy; and the cause of this pushing of the heart backwards and to the left, is to be found in the condition of the aorta, which is largely dilated, as proved by its increased breadth of dulness, and has an aneurismal bulging on its ascending portion just above the heart, pressing upon the right bronchi, and especially upon that distributed to the lower lobe of the right lung, as revealed by the alterations in the percussion note over that lung, and also by the enfeebled and defective respiratory murmur audible over the same part of the chest. The aorta is probably in this case in the state of a cirsoid aneurism, largely dilated, with at least one bulging just above its commencement. At present, however, we have to deal with this case simply as an example of a third mode in which the murmurs of aortic incompetence are produced and propagated. This patient has never suffered from rheumatism, and the incompetence of his aortic valves is probably entirely due to the dilatation of his aorta. As I have already shown, and shall by-and-by illustrate, the first effect of aortic dilatation is the forcible closure of the aortic valves, and the production of a markedly accentuated aortic second sound.[1]

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[1] Vide Edinburgh Medical Journal, June 1874, p. 1079.

As this dilatation proceeds, the valves become too narrow perfectly to close the large orifice, and accompanying this accentuated second sound we have a diastolic murmur of greater or less intensity. Though such an aorta must be atheromatous, yet, if it be tolerably smooth, there may be no diastolic murmur audible above the valves; if, however, it be roughened by projecting spiculæ, the diastolic murmur may commence high above the valves, and in any case it is frequently so loud as completely to obscure the aortic sound. In the earlier stages of this affection, appropriate treatment frequently favours the contraction of the vessel, and causes the complete vanishing of the diastolic murmur, the second sound remaining, however, permanently accentuated, while the diastolic murmur is, as may be supposed, exceedingly apt to recur. In all such cases the valves are seldom much calcified, frequently they are quite flexible, and when they are so, they present no obstacle to the egress of the blood, the systolic portion of the murmur being sometimes, though probably rarely, due to the production of fluid veins by projecting spiculæ, more frequently to the tensile vibrations produced in the arterial walls by the wave of blood disproportionate to their calibre, sent forward by the dilated and hypertrophous ventricle, and by far most commonly by the production of fluid veins in the blood passing through the comparatively narrow orifice into the aneurismal dilatation beyond. If there be spiculæ projecting from the interior of the aorta, the diastolic murmur may be partly due to their influence; it is always, however, mainly due to the production of fluid veins at the aortic orifice, which forms a comparatively narrow strait between two parts of wider calibre—the dilated aorta and the ventricular cavity. This diastolic murmur has its position of maximum intensity at or below the aortic orifice, and owes its propagation over the cardiac area to the resonant qualities of the sternum and ribs. The double character of the arterial murmur is due to causes precisely similar to those which have been shown to have the same effect in the foregoing case, and has exactly the same significance.

From the foregoing cases we learn, that amongst all the various signs which enable us to detect aortic incompetence or predict its significance, the murmurs which accompany it, and their mode of propagation, are not the least important, and we must always remember, that though a diastolic murmur at or beneath the level of the aortic valves, in the line of sternum, is pathognomonic of aortic regurgitation, yet in regard to prognosis, the ascertaining of the mode of propagation of this murmur is of much more consequence than its mere detection.

The important points which have just been illustrated may be summarized as follows:—A diastolic murmur at or below the level of the aortic valves, chiefly audible in the line of the sternum, is significant of aortic incompetence. If this diastolic murmur be inaudible in the carotid arteries, it is invariably accompanied by a systolic murmur, having its maximum intensity at the aortic valves or in the so-called aortic area, and this indicates comparatively trifling incompetence with considerable obstruction at the aortic orifice, most probably from calcified semilunar valves. If this diastolic murmur be distinctly audible in the carotid arteries, it is invariably preceded by a loud systolic murmur in them, the systolic portion of the murmur being not always very audible in the aortic or in any part of the cardiac area, and this indicates very considerable incompetence with comparatively trifling obstruction. What has been stated as to the murmurs in the carotid arteries, refers equally to those in the femoral as well as in all other arteries. Of course, each case differs from another, and as in practice the most marked examples of great regurgitation with slight obstruction, are found passing into instances of great obstruction with slight incompetence, so the murmurs indicative of these lesions are practically found to vary indefinitely. The cases which have been selected for illustration are, however, tolerably well marked and pure examples of the three principal forms in which the murmurs due to aortic incompetence present themselves. A double murmur in the arteries being always the result of great incompetence, and if associated with a history of rheumatism, due to excessive retraction, and possibly ulceration of the semilunar valves, and accompanied by an absence, more or less well marked, of the systolic murmur from the cardiac area; while, if this phenomenon be not associated with a distinct history of rheumatism, the systolic portion of the murmur will be found to be well marked over all the cardiac area, and the lesion will be arterial and not valvular in its origin.

(To be continued.)

ARTICLE II.—*Notes of some Recent Surgical Cases bearing on Legal Medicine.* By JOSEPH BELL, F.R.S. Ed., Surgeon to the Royal Infirmary.

(Read before the Medico-Chirurgical Society of Edinburgh, 15th July.)

IN no branch of our profession do we find the narration of isolated and remarkable cases so valuable as in relation to legal medicine; for, to be properly prepared for cross-examination by ingenious lawyers, the medical man needs to be fenced with precedents either observed by himself or recorded by others. Within the last eighteen months it has been my lot to meet with some cases of very considerable interest and rarity, the recording of which, in the briefest possible terms, may, I hope, prove of some interest to the Society and value to the profession.

CASE I.—*Incised and Punctured Wound of Back of Head. Fissure of Skull. Convulsions. Recovery.*

A. H., æt. 19, night-watchman at Caledonian Station, was brought into the Infirmary at 5 A.M. He had been knocked down, stabbed with a knife in back of head, and his wooden leg had been broken. His wound was considered trifling, and he was sent out. His friends noticed on getting him home that he was alternately comatose and delirious; so, on the advice of Dr Menzies, he was at once sent into my wards, as nearly a year before I had amputated his thigh after a railway accident. I found a small punctured wound a quarter of an inch in length, an inch behind and a little above the level of the right ear. The probe reached the bone, and found it to be bare and fissured.

The patient lay in a comatose condition, with dilated sluggish pupils; every now and then convulsive attacks, clonic spasms of all the voluntary muscles, of an almost tetanic character, occurred. He had a peculiarly vacant expression of countenance, but could be roused for a moment by loud calling of his name, and in such a lucid interval recognised me. His pulse was 54 per minute, full and strong. Lest any portion of the knife should have been embedded in the bone, I gave him chloroform, and cut down on the wound, examining the fissure carefully with antiseptic precautions. There was no metallic substance in the bone, which was split. After this the convulsive movements occurred with such force and frequency that the patient had to be sent to No. 10 Ward, and there strapped down to a bed. He muttered constantly, but no intelligible speech could be made out. He was sensible to stimuli, and could swallow. His head was shaved, and ice applied. Next day, croton-oil was given, which acted on third day. Pulse always 54, quiet and regular on fourth day. Pupils still dilated and sluggish; but patient is quieter, so he was taken back to Ward 6. Occasionally, when roused, he could speak rationally. On sixth day, bowels were again acted on by ♏ii. of croton-oil. He passes water in bed, and sleeps almost constantly. Eats voraciously at one time, and refuses food for a day or two. Fourteenth day, pulse up to 94, wound having suppurated for first time.

During next fortnight there was a very slow but steady improvement, and he eventually regained his senses completely. His pupils remained obstinately dilated and sluggish till after the use of Calabar bean, which contracted them, after which they were normal.

June 1874.—Having seen the patient lately, he is now quite well.

In remarkable contrast to the foregoing, the following case may be noticed, in which an exceedingly severe lesion resulted in no head symptoms whatever:—

CASE II.—M. D., æt. 42, fell from some steps a height of several feet on her head and right shoulder. She sustained a subcoracoid dislocation of the shoulder (which I easily reduced by heel in axilla), and split her forehead in the middle line so deeply that the frontal bone was fissured in all its thickness to the breadth of an eighth of an inch. This fact is vouched for by the medical man who first saw the patient; but it is a possibility that the case was one of ununited halves of the frontal bone, the sutures of which had separated. Be that as it may, the skin wound was brought into accurate apposition, and the patient kept on low diet and perfectly quiet. The whole wound united without a drop of pus or a single head symptom, except one headache on the eighth day, which lasted some hours, and was relieved by an aperient.

CASE III.—*Stabs in Posterior Cervical Region. Wound of Spinal Membranes. Spinal Meningitis closely simulating Hysteria, except in Temperature. Death.*

H. W., æt. 28, married, had a drunken husband, who had left her after a quarrel. He returned after some weeks' absence, took his tea, and went to bed as usual. Soon after going to bed, he got up, complaining of his stomach, and saying he had been poisone as the tea had a queer taste. He said he would go to the Infirmary. While stooping to lace her boots for the purpose of going with him, her husband stabbed the patient several times with great rapidity in the back of the neck, all in the spinal region. Four were in cervical region, all evidently inflicted by a sharp, narrow-bladed knife or dagger, all of considerable depth; all had bled considerably. Another wound was in the left side of the dorsal region of the spine, opposite the tenth or eleventh vertebra, and deeply divided the muscles, without apparently injuring deeper organs. The wounds were dressed with antiseptic precautions. The patient was very weak; pulse scarcely perceptible; temperature normal. In the first five days all went well; wounds seemed to be healing rapidly, with the exception of one of the cervical ones, from which not only a little blood but a semi-transparent fluid, evidently the serum of the cord, kept oozing. On the fifth day she had intense headache. On the tenth, the temperature rose to 103°, with a shivering. She was nervous and excitable, and had the feeling that her legs had been cut off, though voluntary movements were quite powerful, and she tossed and moaned incessantly. In many respects her symptoms resembled a bad attack of hysteria; were it not for the high temperature and the local lesion, diagnosis would have been very difficult. On the fifteenth day, startings of the arms were more marked; the body at times was arched backwards, as in tetanic spasms; and on the seventeenth day she died. I had the benefit of Dr Sanders's kindness in seeing the patient with me.

At the post-mortem examination our diagnosis of acute spinal meningitis from injury was made out in the most perfect manner, the point of interest being,—intense venous congestion of pia mater, with dryness of the membranes. Excessive number of vascular points seen in section of upper part of brain.

I subjoin the report of the autopsy:—

Autopsy, made 9th January 1874.

Head.—Membranes of brain much congested; convolutions flattened. Puncta cruenta found to be increased on section. Lateral ventricles filled with turbid serum.

Spine.—At site of wound, the membranes of the spinal cord were congested, inflamed, and adherent to the cord.

Pus was also detected on the surface of the cord, which was found to extend upwards to the base of the brain. Lymph, about a quarter-inch in thickness, was found covering the optic commissure at the base of the brain, and in this vicinity the membranes and surface of the brain were covered with lymph and pus, and the vessels were congested.

Microscopic Examination.—Abundant pus corpuscles were found in the serum filling the lateral ventricles of the brain.

CASE IV.—*Wound probably penetrating Peritoneum, just over Liver. Recovery.*

P. L., a powerful Irishman, æt. 30, was ejecting a drunken compatriot from his house on a Saturday night, 24th May 1874, when he felt himself stabbed in the abdomen by an open knife.

The wound, eight lines in length, is situated in the right hypochondrium, just below the edge of the rib; it had evidently been inflicted in a slanting direction from below upwards; its edges, especially the lower one, were depressed, and the surrounding soft parts bruised. Black blood was oozing from it. A probe passed in easily more than half an inch, and might have gone further, but it was judged best not to probe deeper. The wound was dressed antiseptically, and patient kept perfectly quiet on low diet. He was dismissed cured, on the eleventh day. He refused to give the slightest hint as to the person who inflicted the wound.

CASE V.—*Wound of Labium from a Kick, resembling an Incised Wound, nearly Fatal from Hæmorrhage. Recovery.*

J. C., æt. 36, admitted 29th November 1873.

During a quarrel about money matters on Saturday night, the man with whom she was living struck at the patient. She, having a child in her arms, avoided him, leaning forward over a bed with her back to him. He kicked her twice from behind; the second kick was followed by profuse hæmorrhage, which nearly killed her before she was brought into hospital. She had on a petticoat and a chemise when brought to hospital, both of which were saturated with blood. The right labium was found to have on its inner surface, just over the edge of the bone, a wound, one and a half inches in length, as clean cut as if done by a knife, dividing it completely down to the bone. The left labium was swollen and bruised. Her state appeared such a dangerous one, that her deposition was taken next day. The wound was plugged with lint soaked in perchloride of iron, and the ostium vaginæ was also securely plugged.

On admission, her pulse was almost imperceptible, and her temperature barely up to 98·2°. In six hours reaction took place, with a pulse of 116 and temperature 100°; after which both began to settle down, and the progress of the case was quite satisfactory. She was dismissed cured on the eighteenth day.

Remarks.—This is one of those cases which at one time were supposed to have been caused by wounds with a knife, from the cleanness of the cut and the profuse hæmorrhage which ensues. The cut is explained by the impact against the bone, the edge of which seems to do the cutting. Similar cases are put on record by Mr Spence of Lerwick in the number of this Journal for June 1857, p. 1099.

CASE VI.—*Attempt at Suicide by Cut-throat.*

S. C., æt. 75, married and intemperate. This aged woman, in a very brief absence of her husband from the room, tried to cut her throat, and succeeded in inflicting a curious triangular wound of skin and platysma.

A razor was used, held apparently in her right hand, and, instead of cutting across and upwards to the right, she had entered the edge in the middle line just at upper edge of thyroid cartilage, and cut a triangular flap of skin *downwards*, getting deeper and broader as it descended, the one end of it reaching left sternomastoid, two and a quarter inches above jugular fossa; the other, the right sternomastoid, about two inches above jugular fossa. The only vessel of importance divided was the large anterior jugular vein. The air-passages were not severed, so the wound was stitched up, and, except the extreme tip, it rapidly healed. She was sent to Morningside in a fortnight.

CASE VII.—*Suicide by Cut-throat. Death from Intralobular Suppurative Pneumonia.*

R. C., æt. 45, a miller, cut his throat in the outset of an attack of delirium tremens with a common table-knife, not very sharp.

The cut was a transverse one across the front of the throat, dividing the thyroid cartilage and exposing the vocal cords. A tracheotomy tube was inserted.

Great difficulty was experienced in feeding the patient. His pulse and temperature, which on day after admission were 110 and 95·8°, steadily but rapidly rose, till on the evening of the fourth day, p., 130; t., 104°. He was freely stimulated, and food was given by the stomach-pump four times a day.

On the seventh day, p., 132; t., 105·8°. He died on the eighth day after admission.

Post-mortem Examination.—A deep transverse wound, five to six inches in length, across the throat, the edges of which were gray and sloughy, divided transversely the body of the thyroid cartilage, and extended backward immediately above the level of the vocal cords into the cavity of the pharynx. The bronchial tubes contained a small quantity of serous fluid, and the mucous membrame was much congested.

The lungs were both much congested, and œdematous in the posterior two-thirds. The anterior edge of right lung was somewhat emphysematous. On section of left lung it was found to present throughout its substance a great number of small yellow points averaging about the size of a pea, and these on pressure emitted pus freely. They were evidently of acute formation, as there was no fibrous induration around them.

CASE VIII.—*Case of Cut-throat. Death from Suppurative Pneumonia.*

T. A., æt. 34, ironfounder, was found in a water-closet; he had cut his throat shortly before he was discovered.

The trachea was completely divided near its upper end, the œsophageal fascia opened, and muscle exposed; the left carotid artery was exposed, but not injured; the sheath of the right one was also exposed. The wound gaped, but there had been little visible hæmorrhage, and the patient was able to swallow. He was fed on milk and beef-tea, chiefly the former, and was kept in a steam of boiling water round his bed.

Next day he was swallowing fairly, and had slept for two hours.

Third,—Slept well, but pulse was up to 120.

Fourth,—Not sleeping so well; pulse 130; begins to have some difficulty in swallowing.

Fifth,—Mucous râles heard all over his chest. Respirations 30 and pulse 130 per minute. He has a cough, and with great difficulty brings up a thick tenacious mucus. Trachea requires frequent cleansing.

Sixth,—Mucus gradually accumulating, and power of coughing it up diminishing. Patient died at 10 P.M.

Post-mortem.—A very brief note is found in the post-mortem register. Small abscesses studded the lungs. Trachea and larynx were congested and inflamed.

CASE IX.—*Suicide by Cut-throat. Ligature of Carotid. Death.*

A. B., a powerful, handsome sailor, patient in Medical House, borrowed a small knife from another patient, and, though it was small and blunt, succeeded, by forcing it in, in a stabbing manner, from the right side of neck, and then pulling it out, in inflicting a terrific wound of the throat, just missing the right carotid artery

close by its bifurcation, dividing upper part of box of larynx, and going right through to just in front of left carotid sheath. It was done so quickly, and with such determination, that the other patients, who saw the whole proceeding, had not time to stop him. Even after he was secured, he tried, by tearing it with his hands, to enlarge the wound. I was sent for to see him, and found him lashed firmly to a bed, with his feet and hands secured, in one of the small cells of the Infirmary. The wound had bled profusely for a little, but Mr M'Leod, my house-surgeon, had tied several small vessels, and arrested any hæmorrhage by pressure. Finding that oozing was going on from a small branch, I thought it prudent to secure the right common carotid with a ligature about an inch below the bifurcation, which stopped all hæmorrhage. This was also an advisable precaution, from the fact that the coats of the vessels were exposed for a considerable distance. The epiglottis was half separated at its base, and had to be secured to the edge of the wound with a stitch, as it fell across the glottis like a valve, and interfered with respiration.

After operation, the man's state was seen to be most precarious from the hæmorrhage. His skin and mucous membranes were pale and anæmiated, his respiration sighing, and he tossed his arms about when permitted. Pulse feeble and empty. He was extremely thirsty, but could not swallow, so was fed by the stomach-pump several times in the afternoon and evening. He never rallied, and died early next morning.

No complete post-mortem was obtained, but my house-surgeon examined the brain, which was intensely congested, notwithstanding all the loss of blood.

CASE X.—*Attempted Murder by Cut-throat. Curious Coincidence. Recovery.*

M. D., æt. 24, a healthy-looking, ruddy Irishman, was brought into my ward on 21st March 1874, almost helpless from intoxication. He exhibited several wounds on his throat, none of them deeper than the skin and cellular tissue. The chief one, beginning with a sharply-defined edge just below the *right* ear, extended downwards and forwards opposite the thyroid cartilage across the middle line; another, beginning about the middle of the first and about ½ of an inch below it, extended parallel with it and about ½ of an inch below it, till it stopped with a tailed-off end opposite left sternomastoid. On my first sight of the patient, before asking him any questions, I expressed my opinion, from the look of the wounds, the lie of their edges, that they exactly resembled an attempt at suicide by a left-handed man, as the only likely way of explaining their shape, structure, edges, etc., was the supposition that they had been inflicted from right to left, and in direction downwards but across the neck. The patient at once stated that he was a left-handed man.

On inquiring into the history, however, it was clearly brought out that the patient had been in company with another man, Ison, who was jealous of the patient's intimacy with his wife; that this man had drunk with Dolan till he was helplessly drunk; had then got him to sit down on a bench beside him; and had, in a pretended outburst of affection, passed his *left* hand, in which was a large clasp-knife, round Dolan's neck from the left, and then cut his throat with a rapid whirl of the knife from right to left. Then, thinking Dolan was done for, he had instantly got up, seized a little child, and, with the same knife, nearly severed its head from its body; and lastly, with such rapidity that those in the room were unable to prevent him, cut his own throat in the most effectual manner, dying in a few minutes. The extraordinary coincidence was found in the fact that Ison also was a left-handed man. Now, it will be easily seen that had Ison succeeded in enticing Dolan into a lonely room, nothing could have been easier for him than, having cut Dolan's throat satisfactorily, to have also killed the child, and, escaping himself, left Dolan with the credit of murder and suicide.

It may be asked, How did this man, who was determined enough to kill his child and himself, so thoroughly fail in despatching his drunken enemy? This was puzzling at first, till we obtained a handsome strong silk neckerchief which Dolan wore that night, and which was hacked through its many folds, but had been sufficient to save the man's life.

Dolan made a very rapid and complete recovery, leaving hospital within three weeks after his admission.

CASE XI.—*Wound of Pulmonary Artery. Hæmopericardium. Death in Five Minutes.*

M. A. was stabbed in a brawl by a short blunt knife. The wound of the skin was half an inch long, at left side of sternum, and close to it, between the junction of the third and fourth ribs to the sternum.

At this point the muscles were torn and pulpy, and the third rib was scored here and there, as if by repeated rubs of the point of the knife against it. The pericardium had an aperture in it corresponding to external one, but was distended with dark, partially coagulated blood. The pulmonary artery was wounded, the wound in it being nearly a line and a half in length. The victim had walked or staggered about forty yards, had then requested to be allowed to sleep, and had died quietly in certainly not less than five minutes nor more than ten after the injury.

CASE XII.—*Accidental Wound of Neck and Larynx. Recovery.*

On 3d July 1874, I was asked to meet Dr Lucas and Mr J. S. Thomson of Dalkeith, at Dalhousie, to see Mr K., who, while sharpening a scythe, had received a fearful wound of the neck by the falling of the heavy vice in which the scythe was fixed from the bench.

The wound extended nearly from ear to ear, was nine inches in length, and, passing through the larynx, divided the thyroid cartilage in the most complete manner, *i.e.*, not only were the two halves separated in the middle line, but each half was cut transversely across by a ragged wound; a flap, with inverted edge and its convexity upwards, consisted of skin and platysma; the sternomastoids were notched at their edges; the sternohyoids both divided transversely; the great vessels and the œsophagus had escaped. Dr Lucas and Mr Thomson had sewn up the extreme edges of the wound and stopped the chief bleeding vessels.

On my arrival we gave chloroform, and investigated the wound more thoroughly, tying all remaining bleeding points. I then performed tracheotomy, making a linear incision in the usual place, and inserted a tube. This not only gave access of air, but also acted as a drain to the flap, which had been cut so as to retain all discharges. I then, with deeply-placed catgut sutures, brought the severed portions of the thyroid cartilage into accurate apposition. This was easy enough, by taking the precaution of passing *all* the sutures in the different directions before tying *any* of them. I then carefully and accurately brought the whole of the rest of the great transverse wound into apposition. We placed the patient in a large airy room, and ordered a good fire to be kept up, and steam to be always in the room.

On the 6th I saw him again, with Drs Thomson and Lucas. The bulk of the wound seemed to be healed, and he was wonderfully well, but once or twice he had bled rather freely from the tube, causing some alarm. This blood, which was recent, seemed to come from the mucous membrane of the larynx itself, and was ejected partly by the nose and partly by the tube. There was also here and there in both lungs crepitant râles, due, doubtless, to the presence of clotted blood, and perhaps breaking up clots of blood in the lesser bronchi. There was a little frothy grumous discharge from the tube. He was ordered to have turpentine stupes to his back, and be well fed with milk and beef-tea.

On the 14th the tube was removed, and the patient's voice was wonderfully distinct, and on the 29th July he called for me in town. His great wound was soundly healed, almost entirely by first intention, and the tracheotomy wound also was represented only by one or two small granulations. A laryngoscopic examination, which he bore well, showed that the vocal cords were in good position, though still slightly thickened. His voice was hoarse, but improves daily.

From the brief and bald narration of the above cases, certain lessons may be learned, and data for future reference recorded. Case I. shows what severe symptoms may result from an apparently *trifling* lesion of the head, while Case II. tells of a much *graver* lesion without symptoms of any kind. Case III. records with some precision the progress of an exceedingly rare injury—wound of the membranes of the spinal cord, without any symptoms of wound of the cord itself. The recovery of Case IV. renders the amount of actual injury doubtful. Case V. is a well-marked example of a form of injury which has sometimes been misunderstood. The fatal cases of cut-throat (VII. and VIII.) are good examples of a pathological condition which, in English surgery at least, seem hardly to have attracted sufficient attention—*i.e.*, the occurrence in the lungs of numerous small abscesses of acute formation. These are by no means uncommon in cases in which, from any reason, blood has got into the bronchial tubes. I have seen them after the operation of tracheotomy, as well as after cut-throat by suicides, and the natural explanation seems to be that they are the result of the presence and subsequent putrefaction of blood-clots, which, having been drawn in during inspiration, cannot be afterwards expelled. Cases IX. and X. are interesting in a legal point of view, as in IX. the knife seemed so utterly unsuitable for the purpose that, had the deed not been witnessed, much difficulty might have been found in explaining the lesion; and in Case X. the circumstantial evidence might have been very perplexing. Case XI. is a contribution to the question of how long a man may live after a wound of the pericardium and pulmonary artery; while I venture to think that Case XII. is one of very considerable rarity, and, in its result, highly encouraging.

ARTICLE III.—*Notes of a Case of Chylous Urine.* By ROBERT SMITH, F.R.C.S.E.

THE early history of this case is defective. It is gathered from the narrative of the patient herself and from her husband, both of whom, however, must be considered quite competent to relate, at least as far as their observation extended, what could not but have forced itself on their attention. It was not till a late period of the disease that it fell under medical care, hence the want of precision in the earlier observations; but the narrative of the woman and the observations of her attendant so far coincide as to form only one continuous whole, from which the progress of the case can be clearly gathered.

The patient, a married woman, 56 years of age, had enjoyed almost uninterrupted good health till about two years previously, when she began to be annoyed by a constant pain in the left side, in a position which, as described by her, corresponded to the region and course of the left ureter. Though usually mild in its character, it was subject to periods of exacerbation, when the pain became acute, and was accompanied by sickness; but these periods were of short continuance, and only left her a little alarmed and weak when they had passed. Yet it was wearing from its constancy, and she suffered even more from her uncertainty as to its nature and cause, while her apprehensions as to its course and termination aided very materially in reducing her to a miserable state of nervous prostration. New symptoms, too, began to show themselves. She experienced a scalding pain, extending upwards along the urethra, when she voided urine, at the same time that the quantity became diminished; her breath became short, and her ankles swelled towards night. As the swelling subsided before morning, she seems to have been partially reassured, but she nevertheless now for the first time sought medical advice. Very judicious treatment seems to have been adopted, and the most pressing symptoms were relieved. But with change of residence followed a period of neglect. Nothing was done. Meanwhile a swelling at the seat of pain in the left side became apparent, which, enlarging, became very sensitive on motion or pressure. From being active and vigorous she became dull and weak; her spirits flagged; and she sought to palliate her misery by reclining, from the relief the recumbent posture alone afforded, as she said, although probably advancing debility had a larger share in her wish for rest than she was aware of; for it is certain that a considerable degree of weakness existed, but it probably escaped unnoticed, she being in fact unable from another cause to do anything which could serve as a test of her real state.

She did not note how long this continued, but remembered distinctly that, having experienced a temporary relief, she one morning took a walk. This induced a return of her agony; and from this morning she dated her rapid decline. She returned with difficulty, threw herself on her bed, and felt overpowered by a feeling of faintness. Then something gave way internally, the *swelling* in the side subsided, and after her first sensations of alarm and faintness wore off, she found herself free from pain, and slept in comparative comfort.

The urine next passed looked like thick blood, very different from any previously passed by her. There is no doubt but that it contained blood and pus, the latter tending to thicken it, while the quantity of blood, though absolutely small, would appear much more in her eyes than it really was, as most probably it was diffused through the whole, and would impart a uniformly red or blackish colour to the mass. After this the quantity of urine passed gradually became increased; it became of a dull white colour, and a heavy sediment fell to the bottom of the vessel on standing. As she could walk easily and was free from pain, she now hoped that her recovery was only a matter of time; and as it was only during the act of micturition that the old sensation extended along the urethra, she forbore to seek advice. The œdema disappeared from her ankles, notwithstanding that she began to drink freely of water and other diluents, from a ceaseless thirst that now began to show itself. Weakness set in, a sense of weight—not of pain—affected the loins, the appetite failed, and she lost flesh. A disinclination for exertion of any kind overcame her—for bodily exertion, indeed, she had been long physically incapacitated—and she experienced an increasing desire to rest and to be left in quiet.

Other dispiriting symptoms soon supervened. Excoriations affecting the vulva, accompanied by itching, added greatly to her discomfort. These, with her increasing emaciation and debility, weighed heavily upon her, and when first seen it was evident that nothing could be done to save her life. It only remained to soothe her remaining days upon earth by endeavouring to palliate the sufferings which made existence a misery, and removing the cause of such as could be cured; but an effort was made to sustain the powers of the system, at the same time that attention was directed to the removal of the excoriations, which were evidently the real cause of the itching. These speedily yielded to local treatment, but only the most transient improvement showed itself in regard to the general health. For a time the onward progress of the emaciation appeared to be arrested, and her appetite decidedly improved; but she gained nothing. The total quantity of urine passed was slightly diminished, but the proportion of sediment and water retained nearly the same relative amount as before. Wakefulness set in, and within a week of her death a plentiful crop of eczema appeared on her face and neck; while two days later the flexor sides of both arms were covered with pemphigus, from a little above the elbows to the wrists, but by far the most thickly on the forearms. Her face was now much swollen and disfigured. A profuse discharge took place as the eczema progressed, and her restlessness became constant, and was attended by delirium. During the last two days of her existence this passed into coma, from which she could only be partially aroused at first. It gradually deepened, however, and she passed away very quietly, profoundly comatose. After death the face assumed its natural proportions and aspect, the eczema having disappeared.

The urine, a good specimen of that known as chylous, when recently passed, was thick and uniform in colour—a dull, whitish tinge. On being allowed to stand in a glass vessel, a flaky sediment slowly separated, and became deposited at the bottom, where, when the process was completed, it occupied one-third of the whole space filled by the quantity set apart. The supernatant fluid possessed the usual characters of ordinary urine. The sediment consisted of albumen, a little fat, and a large quantity of pus. The whole had a specific gravity of 1011·5.

The remedy which afforded most satisfactory results, as far as the diminution of the quantity of the urine passed was concerned, was gallic acid, but owing to distressing symptoms which supervened on its use, even in small doses, it was discontinued. Mild ferruginous tonics were then administered, with a simple nutritious diet. Malt liquors and spirits were wholly discarded; and though accustomed to their use, she expressed herself more comfortable and better without them, especially during the afternoons, when she had been flushed, restless, and feverish, while taking them, and had so been deprived of sleep at that time. This she now enjoyed for an hour or two during the heat of the day. The appetite, however, never fully recovered itself. Her emaciation was extreme; and her anxious countenance, her pallor, her sunken eyes, and the bright spot on the cheek, in such contrast with the pale face, told very forcibly of one who had suffered from a long-continued and exhausting discharge.

ARTICLE IV.—*Case of Sudden Death from Angina Pectoris, with Remarks.* By JOHN WILSON, L.R.C.P. & S. Ed., Kirriemuir.

(*Read before the Forfarshire Medical Association at its Annual Meeting held at Dundee*, 16*th July* 1874.)

OUR record of cases of angina pectoris is of such a meagre kind, and our knowledge of the pathology of the disease is so limited and doubtful, that any addition to either should be received with interest by the profession. The following history is given as a contribution to our knowledge of the subject:—

R. R., a farm-servant, aged 23 years, had been living with his brother for some weeks previous to his death. He was out of employment at the time, owing to a dispute with his master. His brother stated that he had always been very healthy, and that he had never heard him "complain of anything particular, except a simple cold at a time." He had, however, been suffering for two or three weeks from a cold and hard cough. On Friday the 2d January, he had also complained to his brother that he had been seized with an intense pain in the breast, striking through to the back, and so severe had it been that he had to stand and hold his breath until it passed away. This was all the history previous to the circumstances which I now proceed to relate.

On the 3d January, about 9.30 P.M., after he had partaken heartily of a supper of tea and bread, he volunteered to go for a "race" of water to the burn. The night was intensely cold (a severe frost having set in during the afternoon), the wind was a keen northerly one, and the night "rime" very heavy. The burn was distant about 200 yards north of the house, and to reach it he had to go round the end of the house, and down a path through a ploughed field. After the lapse of fifteen or twenty minutes, his brother, wondering at his delay in returning, went out in quest of him. On proceeding about 30 yards on the way to the burn, he found him lying on his face, with his arms outstretched, and having evidently tried to return to the house before he fell. One of the pitchers stood upright on one side of him, and empty, while the other was on the opposite side, overturned, and with no evidence of water having been spilt near. He had evidently got no further than this spot on his way when he had felt something come over him; he had turned to come back, but finding he could go no further (probably from symptoms of approaching unconsciousness), had put down the pitchers, and thrown out his hands to save himself in falling from injury. He had probably lain thus for ten minutes before his brother found him. He was carried into the house, and I was sent for. The place is situated about two and a half miles away, and when I reached the house, I found that he had been dead for some time. A post-mortem examination, by order of the fiscal, was made by me forty hours after death, and the following is a copy of my

REPORT.

I hereby certify, on soul and conscience, that I made a post-mortem examination of the body of R. R., at his brother's house.

The *body* was that of a well-nourished, muscular young man, to appearance about 23 years of age, and of dark complexion. Cadaveric rigidity was present to a considerable degree, and marked cadaveric lividity was observed all over the trunk and neck. I could detect no unusual odour about the mouth or nostrils; nor was there any foreign body or other obstacle to be found in the gullet on inspection and examination by the finger. No marks of violence or injury were to be seen on the body.

The *chest* was well developed, but somewhat contracted from below upwards, as if death had taken place during the act of inspiration. The skin when incised was deeply injected with blood; red and black points were seen in the incised margins, and red and black blood oozed from these. On opening into the *cavity* of the chest, the contents appeared in natural position. The *right lung* was free from adhesions of pleura, except a small part of the lower lobe at its posterior aspect. The upper lobe had the appearance of being collapsed, but it crepitated under the finger, and on being incised showed nothing abnormal. The middle and lower lobes, while they crepitated under the finger, were congested with dark blood, which oozed out when its substance was cut into. The *left lung* had no adhesions of pleura, but it appeared congested throughout its whole substance. This was most marked in its lower lobe, where the congestion was intense. On the surface of the lower lobe, several large dark blebs were visible, one or two of them as large as a crown-piece, and from these, when cut into, flowed a quantity of dark venous blood. The proper lung-tissue was very friable. The congestion of these lobes indicated that there had been an amount of chronic inflammation present in them before the crisis of death; while the blebs showed that there had been a breaking down of, and extravasation of venous blood into, the proper tissue of these lobules. This had taken place either shortly before or during the crisis of death. The *pericardium* was healthy, and contained the normal amount of serum. The *heart* lay flaccid in the pericardium, and apparently empty. It was of a red flesh colour, and had a slight deposit of fat about its base. The cavities, on being opened into, were found empty of blood, and all the valves on minute examination, were found quite healthy. While the walls of the ventricles were a degree thicker than usual, those of the auricles were abnormally thin. There was no disease of the large vessels or of the coronary arteries. The heart was removed for microscopic examination.

The *head* was next examined. On removing the scalp and calvarium, the circulatory vessels were observed to be full of blood. When the membranes enveloping the brain were removed, the latter was found to be quite healthy in appearance. There were no clots or signs of hæmorrhage at the base of the brain. On slicing the brain-substance, and examining the different ventricles, there was the same absence of blood-clots and disease.

The *abdomen* on being opened showed the different viscera in natural position. The *stomach* was healthy externally, and on being opened was found to contain a mixture of partly-digested food and gastric juice, and having no decided odour. The *intestines* were healthy, but loaded with fæces. All the other viscera were in normal condition.

As the *result* of my examination, in conjunction with the history as given by his brother, I am of opinion that death had occurred almost instantaneously, caused by acute spasm of the heart (angina pectoris), said spasm having been induced by sudden exposure to very cold air when the body was warm, and accelerated by the congested state of the lungs impeding the free circulation of blood through them. (Signed) JOHN WILSON, L.R.C.P. & S. Ed.

Remarks.—While my desire is simply to place this case on record, I may be permitted to make a few observations on the several peculiarities of the case. I think the fact that no lesion or decided morbid state of the heart or large bloodvessels was found, entitles us to put this case amongst those of angina pectoris whose cause is unascertained. I certainly do not think that the slight disproportion in the thickness of the walls of the auricles and ventricles respectively, a sufficient primary or even secondary cause, though it might have aggravated matters. (1.) With respect to age (23), it must be classed among the youngest recorded. Trousseau states, "that Fothergill's case was 30 years old, and Desportes relates the history of an individual aged 25, in whom, I may add in passing, that the lungs, heart, coronary arteries, great thoracic vessels, or the valves at their cardiac ends, disclosed on examination no change whatever—no induration, no ossification. Heberden had also stated that angina pectoris could come on in youth, and Robert Hamilton that it did not even spare childhood."[1] (2.) The circumstances of his death are unusual and worth being reflected upon. His going out of a warm room, and suddenly exposing himself to the full force of a bitterly-cold north wind, must have caused a reflux of blood from the external surface of the body to the heart and lungs, and induced the attack. In his agony he had evidently turned to come back; but feeling that he was about to lose consciousness and fall, he had set down the pitchers to save himself with his hands from injury. In this he had succeeded, as there were no marks of bruises on any part of his body. This, I think, sufficiently accounts for the position in which he was found, and showed up to what stage of the attack he had retained consciousness. As to how the climax of death had been produced, I am inclined to the opinion that the heart had remained so long in a state of contraction, the exciting cause continuing to act, as entirely to disable it from resuming its normal function. The absence of consciousness, and also of such external stimuli as might have been used had the attack taken place where friendly aid would have been rendered, completed the evil. The heart had literally wrung its own life out. (3.) Lastly, regarding the general subject of angina pectoris, I venture to give my adhesion to the view now generally entertained of its being a *neurosis* —but not of such a kind as Dr Moinet in his recent article in the *Edinburgh Medical Journal*[1] insists upon. He concludes that it is a paralysis occurring in and depending upon a weakened heart, as no other theory (according to him) can account for the symptoms and history of the disease. I cannot see how his theory can account in the least for such symptoms as the awful pain, intense anxiety, and indescribable terror which the sufferers from this disease so vividly describe. Trousseau, and several other authorities, consider it an *epileptiform neuralgia*, and I believe this is the nearest approach to a solution of the cause. In addition to this view, is it not probable that there may exist in many individuals such a degree of cardiac irritability or over-sensitiveness as may preclude its bearing the least strain upon its regular duties, and against which it rebels by irregular and excited action, as found in palpitation, or by a convulsive contraction, as in angina pectoris? The following somewhat analogous case may serve as an illustration of this view. A short time ago, I had a female patient under my care, age 33, unmarried, and of marked nervous temperament. She enjoyed general good health, but suffered from the following uterine phenomenon:—Her menstruation was regular and normal in every respect, with this exception, that when the flow had begun, and continued for three or four hours, an intense uterine pain started up of a kind she could barely describe, and simultaneous with its occurrence the discharge ceased. The intense pain and stoppage of discharge continued for several hours, forcing her to lie down. She said that the pain was only dulled by two or three teaspoonfuls of strong whisky. This state of matters would go on for from four to eight hours, and then almost all at once cease, when the menstrual flow was again resumed, the period terminating in its usual way. She had suffered from this for years. Now, was this not really what we might call a case of angina matricis, set up by the increased vascularity of the organ exciting its irritability? I could not resist such a conclusion. Irritability, along with ganglionic irregularity of action, might account for this case, as well as for many cases of angina pectoris which occur where no other morbid condition is to be detected.

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[1] Clinical Lectures, vol. i. p. 603.

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[1] Edinburgh Medical Journal, vol. xvi. p. 608.

ARTICLE V.—*Asiatic Cholera.* By Surgeon-Major ROBERT PRINGLE, M.D., Bengal Army.

(*Read before the Medico-Chirurgical Society of Edinburgh, 3d June.*)

BEFORE discussing the subject of this communication, I may be permitted briefly to allude to the circumstances which gave rise to it.

While cholera was steadily marching westward during 1873, I was much struck with the various theories advanced regarding the origin and spread of the epidemic, and with the different modes of treatment practised in some of the principal towns on the Continent, as recorded in the medical and other papers; and when the circumstance of a Royal Commission on cholera being about to assemble in Germany came to my knowledge, I drew up this brief communication, in the hope that it might prove of some assistance in its deliberations. On mentioning the matter to some friends, I was advised to present it to the Medico-Chirurgical Society of Edinburgh, in the hope that they would permit it to be read at one of their meetings; this the Committee having kindly granted, at the request of one of their number, I gladly submit it in this form to the profession.

Since this was written in October 1873, the Annual Report of the Sanitary Commissioner with the Government of India for 1872 has appeared, containing an account of the cholera epidemic of 1872, which, for clearness of description and minuteness in detail, must, I think, be allowed to surpass any published account of this or any other cholera epidemic witnessed in India.

The most cursory perusal of this important Blue-book will in many instances reveal the most startling proofs of the present unsatisfactory state of our knowledge regarding the origin and spread of cholera in, so to speak, its peculiar haunts, and that on data supplied by a body of medical officers accustomed to its almost annual recurrence; while, if the mortality following the practice of many medical officers of high standing, of known ability and experience, is examined, an equally unsatisfactory state as regards treatment must be allowed to exist. This, therefore, must be my excuse for intruding these opinions on the profession in this country, as it seems to me hopeless to expect any satisfactory improvement in practice when such conflicting views are held regarding the origin and spread of the disease. As regards my brother medical officers in India, I am sure they will feel that in their, at times, helplessness in combating this fatal scourge, there is ample room for suggestions on this, to India, vitally important subject, as a cholera epidemic like that of 1872 involves a loss in fighting men far exceeding many a severe and protracted campaign; while none but those who have seen a European regiment residing in their cantonments suddenly paralyzed by the spectre of cholera sweeping through their barracks, can form any idea of the mental depression and despair which seizes a regiment when it is known that cholera, against which all present treatment seems to be futile, is in their midst.

To enable me to give in detail my views on the subject of this communication, I shall divide it into three heads or questions:—

1*st.* What is Asiatic cholera, and where does it originate?

2*d.* How does the disease spread, and what are the best measures to prevent it spreading?

3*d.* What is the treatment recommended?

These questions I shall first answer briefly, and subsequently discuss more in detail.

1*st.* What is Asiatic cholera, and where does it originate?

Asiatic cholera is, I consider, the effect produced on the system by the introduction of a poisonous substance, and the symptoms met with, such as vomiting and purging, with cramps and collapse, are due, the former to the efforts of nature to emit the poison, and the latter to the effects of the poison on the nervous system and circulation, probably by some specific action in the poison, increased no doubt by the effect on these systems of this peculiar and sudden process of natural elimination.

As to the origin of Asiatic cholera, there are, no doubt, places in the world in which the disease originates, or rather, having once originated, the poison lies dormant, and suddenly springs into activity, when it meets with systems ready to receive and propagate it; and it is more than probable that there are some such localities in Lower Bengal, where Asiatic cholera may thus be said to originate.

2*d.* How does the disease spread, and what are the best means to prevent its spreading?

The disease, in my opinion, spreads by means of a poisoned atmosphere, aided in a great measure by the poison thrown off during the vomiting and purging alluded to before. This poison, no doubt, in its passage through the body, multiplying indefinitely, like the minute portion of smallpox virus in a case of inoculation, producing not unfrequently hundreds of smallpox crusts, and each crust during a given period capable of successfully inoculating from two to four cases.

The second portion of the question is answered: By collecting the cases of the disease, and thus limiting the diffusion of the poison; while this method of concentrating the poison in the excreta and soiled clothes will also greatly facilitate the best known method of *stamping-out* this or any similar disease, viz., the destruction of the contagion by heat or powerful disinfectants.

3*d.* What is the treatment recommended?

Do not check the efforts of nature to throw off the poison; on the contrary, aid them judiciously (as in the instances hereafter given) by draughts of tepid water to dilute and emit the poison, and, if necessary, even small doses of castor-oil (the indigenous mild laxative of the country where cholera may be said to be endemic), tepid-water injections, and the employment of every known remedy, except the administration of spirituous stimulants, to restore the tone of the circulation, and to bring back the natural heat, but, above all, *judicious and persevering nursing.*

I cannot dwell too much or too strongly on the great value of nursing. I have seen recoveries due, I might almost say entirely, to judicious nursing; and, I may add, many, I fear, lost from this nursing not being available—cases in which the poison had been successfully thrown off, the period of collapse emerged from, and nature, which had thus far fought the battle unaided, sink at last from the want of the timely assistance of judicious nursing.

On the reaction (following the collapse) setting in, food in small quantities, such as soups, etc., must be frequently given, but all spirituous stimulants are to be avoided, as I am now clearly of opinion, that in Asiatic cholera they interfere with the natural powers in their attempts to rally from the severe prostration resulting from the absorption of the cholera poison, and the efforts of nature to emit it. The stimulant which appears to be particularly suitable at this period of the disease is carbonate of ammonia, in combination, perhaps, with sulphuric and nitric ether, in camphor mixture.

Such, briefly, are my views; some, if not most, of which have been previously advanced by others, but chiefly by Dr G. Johnson in his "Notes on Cholera." In my own case, in advancing those which may be original, I do so with the greatest deference, as the result of nearly twenty years' service in the Bengal Presidency, and from the experience and information acquired during that service in numerous cholera epidemics—from the comparatively few cases among healthy and well-fed Europeans, to the awful havoc among weak and ill-fed pilgrims at Juggernauth, the most frequented of Indian shrines; and, I may add, after the trial of most of the orthodox cholera remedies, as practised in India, including also Honingberger's injection of quassia.

The limits of this communication will not admit of my entering fully into the answers to those three questions, and I shall therefore confine myself to the most important points embraced in them.

My answer to the first question is, among other facts, based on the following:—

1st. The sudden nature of the attack and its very frequent occurrence in persons who, to all appearance, are in perfect health, and, without any warning, are seized with the symptoms of cholera poisoning.

2d. The awful rapidity with which some cases of the disease prove fatal. I have known cases of this disease in apparently perfectly healthy persons, proving fatal in less than three hours; and, in some of these instances, not more than one characteristic evacuation or vomit was noticed, and no trace of any of the so-called premonitory symptoms was seen.

Here the non-exit of the cholera poison seems to have acted like the poison inserted by the fangs from the well-filled bag of the cobra, and, in its pent-up form, paralyzed the vital powers, proving fatal with appalling rapidity.

3d. The numerous cases of natural recovery, *i.e.*, recovery without the aid of any medicine or treatment whatever, met with among the crowds of Hindoo pilgrims at fairs or religious festivals—similar indeed to the recoveries witnessed in India from severe attacks of smallpox, as shown by the frightful marks of the disease on the survivors—when the treatment generally has consisted of religious ceremonies and feasts, in which the relations, friends, and priests partake, but not the patient; and, in a few instances, with the addition of anointings with oil and turmeric.

4th. The extraordinary apparent indifference of this disease to all the ordinary remedies employed in other diseases to check vomiting and purging, which is no doubt due in a great measure to the peculiarly unsuitable state of the system at the time for the administration of any of the ordinary remedies employed to check vomiting and purging in other diseases, though I have known of cases which have recovered, in which the medicines administered have been lauded for their efficacy in cholera, when the persistence of the vomiting prevented their remaining more than a few minutes in the stomach.

5th. The wonderful resemblance between the symptoms witnessed in cases of Asiatic cholera, and the effects produced by some known poisons, when taken in large or poisonous doses.

The fact, however, upon which I would lay most stress is one not ordinarily met with, and hence my chief object in submitting my views to the profession. I allude to that marked 3d, and which, for want of a better term, I may designate natural recovery from the disease.

It may be asked where could I possibly have seen such cases? But a religious festival at Juggernauth in India, during a cholera epidemic, will present to the most ordinary observer too many such cases—cases turned out of crowded lodgings into the open streets, or pilgrims struck down on the road, recovering from the collapse of cholera, with but too visible proofs around of nature's successful efforts to emit the poison. Now, nothing whatever had been done for these cases, and yet there they were, slowly *coming to life again*, so to speak, and these wonderful natural recoveries were only equalled by the marvellous power of regaining strength to rise up, and, in the case of pilgrims, to renew their journey homewards.

My answer to the second question is, no doubt, the natural sequence of that to the first, and abundant evidence is on record to show that the ejecta of cholera cases are undoubtedly the main cause of the spread of the disease. The way, therefore, to prevent the diffusion of this poison is, as said before, to confine it as far as practicable within the narrowest limits, and then to destroy it. In India the most successful method is to march from the disease, having previously destroyed the poison generated, and by this means endeavoured to keep the air, etc., as pure and free from the cholera poison as possible. This plan, however, would be impracticable in this country. One of the most fertile means of spreading the disease is water, and among a water-drinking population like that of India, who obtain their supply from wells and ponds, and whose sanitary habits of ablution are too well known and too often witnessed on the margins of ponds and indeed canals to require much description, it need excite no wonder if cholera sweeps off its victims by hundreds.

If water containing typhoid poison can give rise to an epidemic like that lately witnessed in Marylebone, when only used to *clean* milk dishes, what might not be the consequences if the cholera poison found its way into the water-supply of any populous town, through some of the channels capable of admitting the poison being left either unattended to, or simply unprotected?

The absence of sanitary measures, though it may not in Europe *produce* cholera, may yet greatly aid in the spread of the disease by forming haunts for the poison to lodge in, whence the rain and drainage can assist in its diffusion, or from the effect of defective sanitary measures in the atmosphere and water-supply causing diarrhœa and bowel complaints—a state of the system in which cholera poison is most rapidly absorbed, and proves most surely and rapidly fatal.

The same remark is applicable to over-indulgence in unripe or unwholesome fruit or vegetables, producing what in my opinion is erroneously called British cholera; and in support of this view, one of the most active agents in the spread of cholera at Juggernauth, by producing diarrhœa and bowel complaints, is the holy food, as it is termed, upon which the pilgrims principally live while at the shrine, composed of vegetables, chiefly of the melon kind, in various stages of decomposition; and this food is sent all over India, being in some cases weeks old before it reaches its destination—a proceeding which, no doubt, spreads cholera in an *apparently unaccountable* manner, as, independent of its own bad effects, it contains, doubtless, in many cases, the germs of the cholera poison introduced by the impure water used in the cooking, and increased by the filthy state of the sheds in which the food is prepared. While in medical charge of the station of Juggernauth, I have too often witnessed the condition of the vegetables chiefly employed in the preparation of the Mahapurshaud or holy food, having seen them being taken to the temple; so what I record is from personal observation.

There is yet another cause which seems to assist in the spread of cholera, by producing a state of the system in which the cholera poison appears to be most rapidly absorbed; I allude to the effect-induced by dread of the disease. Anxiety and mental depression or alarm, as is well known, frequently lead to derangement of the digestion, resulting in diarrhœa; this, when cholera is present, has been sometimes viewed as the so-called premonitory symptoms of the disease, and thereby proved too much for many a nervous constitution, since, by creating in the system those conditions which favour the absorption of the cholera poison, have, it is to be feared, diminished the chance of recovery, if not hastened the fatal result.

In short, people suffering from diarrhœa or derangement of the bowels, to whatever cause the condition may be due, should not unnecessarily place themselves where there is reason to fear the cholera poison is present to any extent; and, in the case of nurses, clergymen, and doctors, particular attention should be paid to this point.

I may here add a few remarks about quarantine, though, after the wonderful deliverance which this country, with its widespread commerce and close communication with the Continent, has experienced during the past year, these need be but short.

The results witnessed in 1873 at the three ports of Southampton, London, and Liverpool, as following the measures of the authorities to prevent the importation of cholera, and the *stamping-out* of the disease, should it unfortunately have been admitted or exhibited by any cases after landing, and before they were clear of the responsibility of the port authorities,—these results, I repeat, appear to me to fully establish the following, viz., that an insular position, with strict quarantine, and isolation of the cases of the disease, with destruction, as far as practicable, of the poison generated from them, are the best known means of warding off an epidemic of cholera, and this when it is raging on the other side of a channel as narrow as that between England and France; and further, that this was eminently successful as regards England in 1873. Too much importance cannot, in my opinion, be placed on the preceding highly satisfactory result, as I think there can be little doubt that these so-called suspicious cases on board ship from infected ports, while in quarantine, were similar to the cases I shall note hereafter as those of true cholera, diffusing the true poison of this disease, though to a limited extent from the circumstance of the system not being in a condition to absorb much of the poison, and nature rapidly ejecting what had been admitted, before it had time to propagate itself to any great extent. This limited amount of cholera poison also allowed of the ship being more quickly declared free from infection, for reasons I shall give hereafter.

One thing, however, regarding quarantine in a port, and a *cordon de santé* on land, in the case of a frontier or military cantonment, must be borne in mind, and that is, that either, to be of any real value, must be strict and close; anything short of this does more harm than good, as it leads to *concealment*, which allows the disease to spread unnoticed from fear of the punishment attending its admission when known. When, therefore, either of these precautionary measures cannot be *thoroughly carried out*, they had much better not be attempted.

Were it possible, however, to obtain for even any military or civil station in India an exemption from cholera similar to that enjoyed by this country in 1873, the Government would, in my opinion, be justified in sparing neither trouble nor expense to gain this object. As I have previously said, there is something peculiarly depressing in India in the very name of cholera, and when the post conveys the news from cantonment to cantonment of the ravages of this awful scourge, none but those who have witnessed it can form any idea of the mental depression and moral deterioration it sometimes gives rise to.

While on the subject of quarantine, I may mention from personal observation at Mussoorie and Landour, in the Himalayahs, over a period of seven years, during which time two cholera epidemics occurred, that seventy-two hours seem to be the limit between the exposure to the cholera poison and the first symptoms of the disease. In stating this, however, it must be understood that by this I do not mean to imply that this period will suffice for the quarantine of a ship from an infected port, unless there have been no cases of the disease on board during the voyage. Should cases have occurred, however, these three days must be spent where, as far as can be ascertained, no cholera poison is believed to exist.

My reasons for arriving at this conclusion are based on the following circumstances, noticed by me during the period alluded to previously as having been spent in the Himalayahs, viz., that not a single case of cholera was met with either in the civil sanitarium of Mussoorie, or the military convalescent depôt of Landour, in which a visit to the cholera-infected plains could not be traced to within that period of three days. I can write with some confidence on this important point, as I made particular inquiries into these cases of cholera, and indeed attended some of them.

In the cholera epidemic of 1872, it was thought that an exception had been found to this rule, and a case of true cholera, originating in Mussoorie, was believed to have been met with. The man was a cowfeeder, living in the centre of Mussoorie, who was stated to have never left the station; on making close inquiry, however, I found this man had gone to his village in the plains, where cholera was present, with some cows which had gone out of milk, to be replaced by others in full milk; this the man did without, however, even staying a night in his village, but returning at once to Mussoorie. Within three days of this visit to an infected locality, this poor man was seized with cholera and died.

I give this case in detail, as an imaginary *cordon de santé* was supposed to exist between these sanitaria and the infected plains, five or six miles distant; hence the concealment regarding this man's visit to his village, which must have been well known to his neighbours.

Without attempting to explain the causes to which this exemption is due, I may here mention, that I have not, during my residence in this portion of the Himalayahs, known of a single case of true cholera in either of the sanitaria under notice which could be traced to the contagion generated by these cases; for, though measures were taken to destroy the poison, yet I am not prepared to credit this wonderful exemption to these precautionary measures alone.

As regards my answer to the 3d question, and the mode of treatment therein advocated, I may here state that, in my opinion, there are no such symptoms as premonitory symptoms, since, if my theory, as given in the first answer, is correct, I cannot see how such symptoms can exist. A certain poison has found its way into the system, and this poison, either from some inherent property induces purging and vomiting, as part of the natural processes of its propagation and dissemination; or, as in the case of some other poisons, the system attempts to emit it by these two methods, viz., purging and vomiting. Thus, these can hardly be termed *premonitory*, when they really appear subsequent to the commencement of the diseased state, which, as noted before, dates from the admission of this poison.

As regards the period of incubation in cholera, I have during my experience seen or heard of no data which would enable me to lay down any rules on this point. The cases alluded to previously of persons in apparently perfect health, without any warning, suddenly exhibiting symptoms of cholera, which may even be so severe as to prove fatal in less than three hours, seem to point to the conclusion that in this fatal scourge there are neither any premonitory rigors nor other sufficiently marked or regularly occurring symptoms to indicate the admission of this poison into the system, similar to those met with in some eruptive fevers. I am therefore inclined to think that the length of time which elapses between what may be considered as the exposure to the poison and the first symptoms of the disease, is regulated more by the state of the system to absorb the poison, and the quantity thus admitted, than by any rules resembling those laid down in the practice of inoculation, for instance; and further, that these two causes—viz., the state of the system and quantity of the poison—regulate the severity of the attack in much the same way that a dose of ordinary poison affects the system, with reference to the quantity taken or given, and its capability of being absorbed, or that of the system to absorb it.

For instance, in the case of a person suffering from diarrhœa or other bowel derangement, due to any of the causes previously given, being exposed to the poison of cholera, a certain quantity of this poison may be taken into the system and rapidly *absorbed*, and nature as rapidly endeavour to effect its emission; and during this process the symptoms of a severe, it may be a fatal, attack of cholera are witnessed.

On the other hand, I have seen cases in which the cholera poison has been apparently taken into the system, but, owing to certain causes due to the state of the system at the time, or to the limited amount of the poison admitted, it was not *absorbed*—by this I mean to the extent of producing cramps and collapse—but was passed off by either slight vomiting or purging. In short, in these cases nature had effected the cure, though the credit may have been claimed by nostrums, or given to a certain line of practice.

During an epidemic of cholera in Calcutta, I suffered from an attack of the disease similar to those I have described, which stopped short of cramps and collapse, but nevertheless in a few hours weakened me considerably, though, being previously in excellent health, I quickly regained my usual strength, without any biliary or other derangement. The acetate of lead and opium, with dilute sulphuric acid, which were given during the prevalence of these cholera symptoms, appeared to have no effect on them, as they as suddenly ceased as they had appeared, and after a quiet sleep, with the exception of weakness, I awoke with no trace of the dangerous attack from which I had suffered during the night.

There could be no doubt that this was as real a case of cholera as any met with during this epidemic. I went to bed perfectly well, after dining as usual, and was suddenly awoke at midnight with these symptoms of cholera poisoning. The disease was very prevalent at the time, and a brother officer had died of it shortly before I was seized, and close to where I was residing.

I allude to this case in detail, as, during every cholera epidemic of any extent, cases of this type are very numerous, and in this country may be termed British cholera, or cases of true Asiatic cholera cured in the premonitory stage by narcotic and astringent remedies. After what I have recorded as my view of this premonitory stage, or these symptoms, I need not allude to them further, except to repeat that, in my opinion, these cases are in reality mild cases of cholera, but yet true Asiatic cholera, diffusing the true cholera poison, though to a much more limited extent than a prolonged case of the disease with frequent and copious vomitings and purgings, which will be easily understood if the poison theory, and its apparently natural process of elimination, and thus propagation and diffusion, is granted.

I may illustrate this by the analogy in smallpox. In this disease the eruption is nature's method of eliminating, propagating, and disseminating the poison of smallpox. The quantity of the poison generated will therefore greatly depend on the extent of the eruption, but one smallpox vesicle will diffuse as true and as surely a variola poison as the most confluent case of the disease ever witnessed, though with this difference, in the former case, to a *very limited extent* as compared with the latter.

As far as my experience goes, one attack of cholera does not seem to impart the immunity which is witnessed under, to a certain extent, similar circumstances in smallpox; which may perhaps be due to the fact that the variola poison seems to attack every individual exposed to its influence, with but very rare exceptions, unless protected by vaccination, or a previous attack of this disease. The cholera poison, on the other hand, like any ordinary poison, appears to be capable of admission into the system at all times; and the symptoms attending this admission may vary from very slight purging, without even vomiting, with complete and rapid relief, to frequent and copious vomitings and purgings, with cramps, collapse, and death.

If such is the case regarding these so-called cases of British cholera, or Asiatic cholera in its premonitory stage, it might be urged that it is hopeless to talk of destroying the poison generated; but in these cases this poison is originally so limited in quantity, and so little if at all increased by its quick passage through the system, that much less active measures are necessary to destroy it, though not on this account the less necessary, as the evacuations must not be treated like ordinary excreta, but ought to be submitted to the action of powerful disinfectants, which will effectually destroy this poison in the ejecta, while *boiling* water will act similarly in the case of the soiled clothes or linen.

While alluding to the cases termed British cholera, it appears to me that it would be better if the term cholera were confined to cases of real Asiatic cholera, as much anxiety and alarm would, I have no doubt, be allayed if it were once known and fully acknowledged that there can be no such disease as British cholera, if the term British is meant to imply that there is a species of cholera indigenous to the British Isles and distinct from Asiatic cholera properly so called. There is something in the name of cholera, as before stated, which appears to have a peculiarly depressing effect on many minds, connected, no doubt, with the feeling of despair attached to the frequently hopeless character of the treatment generally employed in checking the vomiting and purging. This, I think, would be in a great measure removed if the term cholera were confined to cases of true Asiatic cholera, and the fact laid down that nothing but true Asiatic cholera, in this country at least, can produce that disease, as smallpox can only originate from the absorption of the variola virus.

But it may be asked, How is it possible to distinguish between cases of true cholera and very severe cases of diarrhœa, exhibiting, it may be, symptoms closely resembling those of cholera? This, I must at once admit, will require careful diagnosis, founded chiefly on the previous history of the case; as, for example, when called upon to decide whether such a case is one of true cholera, or is merely due to over-indulgence in unripe or unwholesome fruit, meat, or fluids. To those who have witnessed extensive epidemics of cholera, there is, in a true case of this disease, a something in the look and other symptoms, independent of the vomiting and purging, which might almost be said to indicate the true character of the attack. But this is only to be acquired by experience, so some other mode of diagnosis must be sought for; and, as I said before, this is to be found in the previous history of the case, always supposing that the probability of cholera poisoning is not clearly established. Should, however, cases of cholera be known to exist in the neighbourhood, then, fortunately for our escape from this difficulty, the treatment by elimination would be equally correct for the case of cholera as for one of violent diarrhœa, due to the presence of undigested, or, what is worse, undigestible food in the bowels. In both cases there is something that requires to be eliminated from the system, and in both nature is making violent efforts to effect this.

One of the greatest difficulties in a treatment based on the elimination theory will be in seeing that this is not carried too far, and the treatment thus run a risk of aiding the dangerous symptoms of the disease, viz., the excessive and frequently fatal extent to which this process of natural elimination often runs. The cases, I should think, would be but few in which these efforts of nature would require much assistance by drugs, either as emetics or purgatives, and under almost *any* circumstance, I can think of no emetic equal to tepid water, nor any mode of relieving the bowels, under *these* circumstances, superior to tepid-water enemata; true, I have mentioned castor-oil, but merely as an indigenous, mild, and thorough laxative, but the cases would be rare in which its exhibition was applicable. Cases, however, are not unfrequently met with in which, after slight purging and vomiting, but chiefly the latter, the most distressing, because inefficient, attempts are made to vomit. This should, if other symptoms justify it, be accepted as an index of the natural line of treatment, and large draughts of tepid water should be given, as before stated, to dilute the poison, aid in its emission, and impart a certain amount of warmth internally; and with a similar object tepid enemata might at the same time be beneficially administered, though both must be discontinued when relief is experienced.

After what I have previously stated, it is clear that I consider all medicines that tend to check the vomiting and purging, of the nature of narcotics, and particularly opium, or those remedies which act like ice, must act injuriously. I need therefore not allude to them in detail.

It may be thought that I have attached too much importance to nursing; but all who have watched many cases of cholera will doubtless have noticed how the efforts of the attendants are relaxed when collapse sets in, and those around see how futile have been their attempts to check the vomiting and purging. So convinced am I of the importance of this point in the successful treatment of cholera, that if this brief communication draws increased attention to this part of the subject only, I shall feel amply rewarded for any trouble it may have cost me. On mentioning this to a medical friend in this country, he said it recalled a case in point, which occurred while he was an assistant in the country during the cholera epidemic of 1849.

On one occasion when there were several cases of cholera in the village, he was left in charge of them while his senior was visiting the country patients. Before leaving, he said to my friend—"You need not go to see so-and-so, as he is in the stage of collapse, and will be dead in a few hours." The assistant, however, saw the case, administered a stimulant with carbonate of ammonia, persevered in his efforts to restore animation, and was rewarded by seeing the case recover; and concluded by adding, that he had but lately seen the man whose case had been considered hopeless. Whether the stimulant saved this case or not, is not so much to the point at present as the light in which the case was viewed by the senior practitioner.

As well leave a body in which life still lingers, and just taken out of the water, to die uncared for, or a case of poisoning by opium in the stage of stupor to "sleep the sleep that knows no waking," as leave a case of collapse from cholera unattended to as hopeless. My conviction is, that as it is but little we could, in our present state of ignorance regarding any specific for this disease, do *before* this period, so *now* is our time. Nature has, so to speak, thrown off the poison, but the struggle has nearly ended in death, and we are now called upon to aid nature in rallying from the fight. And how is this to be done? Mainly by restoring the heat to the body and tone to the circulation by means of warm applications, and frictions, and sinapisms, with, if necessary, large turpentine poultices, in the hope of acting on the capillary circulation; by the cautious administration of food in the form of soups; and if any stimulant is required, carbonate of ammonia with sulphuric and nitric ether in camphor mixture. Again I must repeat that spirituous stimulants, such as brandy or champagne, do not appear to be suitable till convalescence has set in, and the various functions of the body are to a certain extent restored.

It may be asked, And what success has attended this line of treatment? Well, it must be admitted, that too frequently the most skilled and careful nursing—which is really what is implied in the line of treatment just laid down—often fails, and the patient never rallies from this period of collapse. Yet, notwithstanding this absence of general success, one point is quite certain, viz., that this nursing can do no harm, since, if a case is to recover, it can only be by heat returning to the body, and tone to the circulation. Again, in this treatment by elimination, we may rest satisfied that we are doing nothing likely to retain the poison in the system, nor yet to reduce the system unnecessarily, by allowing or inducing the vomiting and purging to continue, after the poison is eliminated, if, in our ignorance, we trust to nature indicating when the process of elimination is completed.

As regards the treatment of the convalescence from cholera, the dangerous symptoms to be apprehended are connected with the restoration of the tone of the circulation, and chiefly as it occurs in the brain. It is here that spirituous stimulants may do much harm, while the stimulant mixture noted before will be found most suitable.

With all this system of careful nursing, I must, however, state that I have seen not a few cases recover from the stage of collapse without any treatment whatever, and, as alluded to previously, in an incredibly short space of time resume their homeward journey. It is the remembrance of these cases of natural recovery, met with in the first years of my service, that have, after the lapse of so many years, shaken my faith in the treatment I have myself (till lately) adopted, or seen others practise. This change in my treatment is mainly due to one case in particular, seen in the epidemic of 1872, and to the success attending the treatment adopted in some cases met with subsequent to that case. In the instance alluded to, the only treatment employed was copious draughts of water, given in ignorance of the true character of the disease, but in response to the urgent cries of the poor sufferer for "water," "water." I first saw this case shortly before it entered the stage of collapse, from which it recovered, though it sank from the head symptoms just described when alluding to the treatment of the convalescence from cholera.

The scenes witnessed at Juggernauth during the first years of my service can hardly again be met with in India, as I hope the late sanitary regulations have put a stop to such sights; but some idea may be formed of the mortality during one cholera epidemic, which happened while a (so to speak) peculiarly sacred return of the car festival was being celebrated, when the number of pilgrims far exceeded those of many previous years. On this occasion the mortality was so great, that the natives, in alluding to it, were in the habit of saying that, of every sixteen who left their homes, four died on the road, four at Juggernauth, four on the return-journey (during the rains), and only four survived the pilgrimage. These figures may be exaggerated, but no picture I could paint could convey any idea of the horrors of that pilgrimage. Let one incident suffice. I treated a little boy for severe bites from a jackal, received when protecting his father in the stage of collapse from the savage attacks of one of these animals in the outskirts of Juggernauth. On questioning these and other pilgrims on the types of the disease seen on the line of their march, they have frequently described what must have been mild attacks of the disease cured by nature, as also severe cases, such as instances of twenty or thirty falling asleep under a tree, weary and exhausted, and in the morning several having to be left, either dead, or it might be in the stage of collapse, to die or recover, as the case might be—alarm at the fate of their companions preventing their halting, and their weakness and poverty preventing them from carrying them with them.

I have purposely omitted in this communication all allusion to the post-mortem appearances met with in the cases which I have examined, as they were so similar to those described by Dr G. Johnson in his "Notes on Cholera." In my opinion, the means by which the true character and nature of the cholera poison will be discovered will be found to lie in the microscope, which will, I doubt not, prove the following, viz., that the human body is as much the natural soil for the deposit of this cholera poison, in which it is *alone* propagated, and from whence it is disseminated through the ejecta, as the earth is for the various seeds committed to it.

In conclusion, I must fully admit that I have not touched upon many important points, the necessary brevity of this communication having prevented my doing so; those which I have discussed more in detail appearing to me to bear more directly on the views I have advanced, and, above all, on the vital importance of careful and persevering nursing in the period of collapse and subsequent convalescence.

ARTICLE VI.—*On the Minute Anatomy of Muscle and Tendon, and some Notes regarding the Structure of the Cornea.* By G. THIN, M.D., London.

IN a paper read during the last session of the Royal Society, which will be found printed in the *Proceedings*, I contributed, amongst other things, the results of observations I had made on the minute anatomy of muscle and tendon. Since that paper was written, I have continued my investigations into the structure of those tissues. The results which I have obtained supplement those described in the essay referred to; and I now give an account chiefly of the additional facts observed since it was presented. In the previous essay, I gave my reasons for believing that a muscular fibre (primitive fasciculus) is formed by the combination within the sarcolemma of several large bundles, which are separated by dilatable spaces, and in which ramify a system of elastic fibres, these latter being nothing less than anastomosing processes of branched cells, the nuclei and protoplasma of which can be seen occupying the stellate spaces between the bundles.

The septa which mark this division into compartments are best seen in gold preparations, in which the astringent effect of the chloride is pronounced, but they can also be seen in a less marked degree by various other modes of preparation. Some of these also show the division of the transverse surface of muscle into the three and four cornered fields described by Cohnheim as being seen in frozen muscle; and it is therefore evident that each compartment is composed of a number of Cohnheim's fields. If fresh muscle[1] is cut transversely with sharp scissors, the thin pieces so excised placed in a strong solution of extract of hæmatoxylin and alum, and excess of colouring removed by acetic acid, the sharply-defined borders of Cohnheim's fields are seen with great distinctness.

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[1] I state once for all, that the observations on muscle recorded in this paper apply exclusively to the muscle of the frog and mouse.

In order to isolate the branched cells of muscular fibre, I coloured deeply with gold, and then macerated in concentrated acetic acid, for periods varying from 6 to 24 hours, and in some cases at a temperature of 100° to 110° Fahr. Many preparations so obtained are failures, but others in clearness leave nothing to be desired.

In some of these, when teased, cells are seen identical in appearance with the ordinary branched cells found in connective tissue, with long ramifying branches. Entangled amongst their fibres are the remains of the thin flat cells about which I shall have more to say. (See Fig. 4, Plate I.)

In others, the larger cells and their processes are seen to constitute the skeleton of a minute network. At every angle formed by the network there is a small patch, generally triangular in outline, coloured purple by the gold. This network may be seen lying in the substance of the fibre when the latter is broken obliquely, but fragments of it may also be found lying completely isolated. The minute fibres of which it is composed are clear and glistening, and to the eye have the appearances that are supposed to indicate the smallest form of elastic tissue.

In regard to the purple-stained patches at the angles of junction, I consider that the shade of colouring produced by the gold identifies them as being composed of protoplasma similar to that constituting the substance of the larger cells, and of branched cells elsewhere.

I have not seen any appearance which could be considered distinctive of a nucleus, but have sometimes seen a clearly-demarcated part of the substance darker than the rest.

The larger cells send out processes on all sides which form part of the network. The anastomosis between the large cells and the small patches, which I also consider to be cellular, is complete.

If muscular fibre is put up on an object-glass in a mixture of half per cent. solution of chloride of gold and concentrated acetic acid, evaporation prevented by the use of asphalt, and the preparation set aside for some days, a series of instructive changes takes place. These vary according to the proportion of the two fluids in the mixture.

If the acetic acid is in excess, after a few days the fibre is seen to be traversed longitudinally by a great number of fine fibrillæ, which present oval swellings at short intervals, and which are parallel to each other, and to the long axis of the fibre. (See Fig. 3, Plate I.)

These fibrillæ are sharply defined and glistening, and at once recall to mind the appearance of the finest order of elastic fibres. When the muscular fibre is broken across obliquely or torn, the longitudinal fibrillæ are seen to communicate by processes which leave the oval swellings with a network similar to that seen by the gold-staining process above described.

From the torn edge of the muscular fibre these longitudinal fibrillæ are seen projecting beyond the other muscle substance. The oval swellings are in this position especially distinct.

When the acetic acid is in considerable excess over the chloride of gold, a striking and beautiful effect is sometimes produced. The fibre is seen pouring forth from its mouth an immense number of rounded discs, which distend the torn edges of the sarcolemma, cover the field immediately surrounding the end of the fibre, and are dispersed singly to a considerable apparent distance. The appearance may be likened to that of a bag of coins being emptied. For the twisted horn of the cornucopia substitute a straight cylinder, and the similarity will be exact.

The discs in the mouse are about the size of a human blood-corpuscle. Sometimes they are seen to adhere in circular groups, an appearance which is reproduced in Fig. 5, Plate I.

Their surface has a punctuated appearance.

I refer to the Essay in the Proceedings of the Royal Society for a description of long, thin, flat cells found amongst the fibrillæ of the muscular fibre of the frog when treated by the gold solution. These cells are difficult to find; success being the exception. I think they are most easily found in the muscles of an œdematous limb. I reproduce in Fig. 1, Plate I., one of these cells, in which the nucleus is well marked. The flat cells in muscular fibre are also capable of being seen by a special mode of preparation.

A small portion of muscle is teased in a half per cent. solution of chloride of gold, and allowed to remain in the solution for two or three days. It is then mounted in the mixture of chloride of gold solution and acetic acid, the acid being in considerable excess, and exposed to bright sunlight. The preparation should be examined daily. After a few days the outlines of faint purple-coloured bodies, arranged in rows within the fibre, become visible. In shape these are essentially of two types, the one long and narrow, the other rounded, or oblong and broad. The long cells are sometimes seen to be in a continuous plane and contiguous longitudinally. I have seen rows of the broad cells in the same plane, and apparently forming portion of a continuous layer; but the most successful preparations have always left gaps to be filled up in order to make the layer complete. The appearances of these cells are reproduced in Fig. 8, Plate II. The broad cells vary in apparent breadth, according as they are seen in face or sideways.

After a few days the cells thus brought into view become fainter, and eventually they completely disappear, nothing remaining permanently but rows of nuclei occupying the position of the broad cells.

When muscle has been placed in a one-sixth per cent. solution of chromic acid for several weeks, and then cut transversely (without any subsequent treatment by alcohol), the outlines of Cohnheim's fields can, in some fibres, be distinctly made out. In such preparations they appear as a homogeneous intermediary substance pierced by fine fibrillæ of uniform size. If the section be slightly stained in hæmatoxylin, the fibrillæ are seen of a blue colour, embedded in a substance which is only faintly stained. The fibrillæ can in such cases be easily counted. In frog muscle, I have found that each "field" contains from about 12 to 15 fibrillæ.

The term fibrilla, as applied to muscle, is not used by all anatomical writers in a very clear sense, being often applied to what is evidently one or more fibrillæ with intermediary substance attached to them. I would follow Kölliker in restricting it to the fine, uniform, apparently cylindrical thread which can be isolated from fibres that have been treated by weak solutions of chromic acid. When two or more such fibrillæ are seen *in situ*, the transverse marking is always more or less distinct. But when a single fibrilla is isolated, and examined by an immersion lens, the most careful examination often fails to detect on it any appearance of striation. A fibrilla from frog muscle is represented in Fig. 7, Plate I.

The fibrillæ can also be studied on fibres treated by gold, and on such preparations the appearances are very instructive, as showing why different conceptions have prevailed of what constitutes a fibrilla. Such a fibre, when the sarcolemma has been ruptured before immersion in the gold solution, is found to be composed of bundles of fibrillæ more or less separated from each other, and capable of being sucessfully teased.

The fibrillæ can then be seen more or less liberated from the cementing action possessed by the intermediary substance when it has been subjected to the astringent influence of the chloride of gold. When a single fibrilla has been found (which is somewhat difficult), the striation is always indicated, but in very varying degree. The indication consists of the purple gold-staining being interrupted regularly by fine lines; and because the amount of it varies so much in the same preparation, I am disposed to believe that the more deeply-coloured intermediary substance always adheres in a greater or less degree to the fibrilla, and produces the marked striation which the latter presents. A fibrilla from frog muscle, treated by gold and highly magnified, is represented in Fig. 6, Plate I.

The structure of a muscular fibre, as indicated by the results obtained by the above methods, I believe to be as follows. A number of fibrillæ of uniform size, parallel to the long axis of the fibre, and embedded in an amorphous intermediary substance from which they chemically differ, form what may be called a primary bundle. In the frog there are from twelve to fifteen fibrillæ in such a bundle. The surfaces of this bundle are covered by long, narrow nucleated unbranched cells.

A number of these primary bundles combine to form what I may call a secondary bundle. The surfaces of the secondary bundles are covered by rounded or oblong flat cells.

I have not observed any appearance indicating the existence of a membrane between the cells and the surface of the bundles, but infer it as probable, from analogy with what I have observed of flat cells in the connective tissues so-called.

The secondary bundles enclosed by the sarcolemma constitute essentially the fibre or primitive fasciculus of muscle.

Between the primary bundles, and embracing them, is a fine network, consisting of anastomosing branches from minute masses of protoplasm. These minute masses I believe to be of the nature of cells, and the network I should propose to call the elastic network of the primary bundles. Each mesh of the network encloses one primary bundle, and each bundle is therefore encircled by a succession of minute, straight fibres, which cross its surfaces transversely, and are parallel to each other. For a clear understanding of this accurate fitting of the network to the primary bundles, I would suggest a comparison of Fig. 2, Plate I., with the representation of frozen muscle in the plate illustrating Cohnheim's paper. Cohnheim's fields represent the surface of the primary bundles cut transversely.

Between the secondary bundles are cells with projecting processes, of an order larger than the elastic network of the primary bundles, for a more detailed account of which I refer to the Essay in the Proceedings of the Royal Society. That they anastomose with each other, and that the stronger fibres of the larger order of cells form a framework for the finer meshes, has been stated above.

The falling to pieces of the contents of the sarcolemma in the shape of the discs of the primitive bundles, is thus capable of easy explanation. The solution of chloride of gold acting on the intermediary substance converts it into a mass of considerable consistency. This mass is capable of expanding under the influence of acetic acid without losing its cohesion. The expansion consequently takes place, and the bundle is pressed on all sides against the fine fibres of the elastic network, which do not swell when treated by acetic acid, and is accordingly sliced into flat discs, in the same way as a piece of cheese would be if pressed against a fine wire.

The fibrillæ, firmly incorporated in the hardened intermediary substance, are cut at the same time.

The slicing action of the network must be assisted by the pressure that the swelling bundles exert on each other.

The extent of swelling can be appreciated by comparing the rounded borders of the discs with the straight borders of Cohnheim's fields.

The circular groups of discs indicate the composition of the secondary bundles.

I use the word disc advisedly, because it seems appropriate to the object to be described, and because I do not think there is any possibility of confusion with the larger discs, which are known as the product of "transverse cleavage," when a muscular fibre divides transversely under the influence of acids. The mechanism of this larger cleavage is not quite so evident, but in principle I believe it to be the same. In this case the elastic fibres which slice the muscles may be either internal or external to the sarcolemma, or both may be concerned in it. If fresh fibres are soaked for several hours in a strong solution of carmine, and then macerated for a lengthened period in concentrated acetic acid, the sarcolemma is seen to be snared by elastic fibres, which deeply indent its surface; and on these fibres the nucleus and scant protoplasm of the cell from which they take their origin retain sufficient colour to identify them both as to their nature and as to their relation to the fibre.

The fine elastic network internal to the sarcolemma I think I can identify as the "Querlinien" of Krause.

A description of the layer of flat cells investing the whole surface of the tendons of the mouse's tail, and of the different forms of flat cells isolated from tendons of the ox and frog by saturated solution of potash, will be found in the other essay already referred to. In regard to the arrangement of the cells in the substance of tendon, I have obtained the following results:—Operating on frogs, I found that unusually successful preparations were sometimes obtained in staining the cells of the tendo Achillis by chloride of gold. Some preparations in longitudinal sections showed patches of flat cells extending on each side from a central and more deeply stained row of cells. In others, a single row of cells would become double, and distinct rows of two flat cells placed side by side were traceable for a considerable length. Some showed irregular patches of similar cells at different parts of the section; but the cells most easily and deeply stained were always those occupying the depressions which correspond to the clefts that indicate the boundaries of the secondary bundles. Good preparations were most easily got from frogs which, as a result of long confinement, had become dropsical in the legs.

I believe the fact that both in gold and carmine preparations rows of quadrangular cells, arranged longitudinally in single file between the larger bundles, are usually alone seen, is due partly to the compact structure of tendon, which usually permits the easy contact of the reagents only in the deeper and wider furrows, and partly, when sections are made, to the greater chances of the knife cutting through the bundles than in passing over the surface of them.

When the knife in a part of the section passes through a space that separates the larger bundles, and leaves the surface uninjured, if the colouring has been complete, so much of the surface will be seen to be covered by quadrangular, oval, or circular cells. A section through tendon showing large surfaces covered with a continuous layer of cells is represented in Fig. 11, Plate II.; and in order to contrast the size of cells seen on the surface of tendon with those seen on section, I have reproduced the surface cells of the tendo Achillis in Fig. 10, Plate II.

The flat cells covering the secondary and tertiary bundles are similar in size and form, and are in tendon the analogues of the quadrangular flat cells which cover the surfaces of the thicker layers of substance in the cornea, between which are the so-called corpuscles.

The long narrow flat cells which cover the primary bundles of the fibrillæ of connective tissue are difficult of demonstration, being generally destroyed before the tissue comes under observation. Tendon which has not been allowed to contract, and has been hardened by a prolonged action of one-sixth per cent. chromic acid, is fitted for their demonstration. Non-contraction is easily secured by immersing a limb that has been separated above the origin of the muscle.

From the leg of a 14-inch sheep fœtus, kindly preserved for me by Dr Klein, from a ewe at the Brown Institution, which I treated in accordance with the above method, I obtained, after it had been in the solution of chromic acid for several months, preparations very clearly illustrative of the disposition of the long flat cells on the primary bundles. In Figs. 13, 14, and 15, Plate III., appearances are reproduced which give at once the form of the cells when detached, and their arrangement on the bundles. It will be seen, that when *in situ* they are applied longitudinally to the surfaces of the primary bundles, and by their borders being applied regularly to each other, they completely encase the latter. These cells are uniform in size. They are identical in form with the cells covering the primary bundles in the cornea. (Compare Fig. 14 with Fig. 18, in which similar cells in the frog's cornea are reproduced.) I have lately been able to isolate by the caustic potash process, cells of the primary bundles of the tendo Achillis of the frog, identical in shape with, and not much larger than, the cells shown in Fig. 13.

The branched cells of tendon—those namely of the larger order, to which my observations and descriptions apply—are conveniently prepared by staining deeply with chloride of gold, and placing sections in concentrated acetic acid for a number of hours, at a temperature of 100° Fahr. The distinctive colouring of the protoplasma of the cells is well marked, and the identity of the long, glistening anastomosing processes with elastic fibres, clearly seen. (See Fig. 16, Plate III.) These processes traverse the tendon longitudinally and transversely between the layers of flat cells, forming a network that embraces the bundles. The cells themselves are seen in transverse sections occupying the centre of the stellate spaces, and are to be distinguished from the flat cells that cover the walls of these spaces, as are their elastic processes, from the thin membranous covering of the bundles seen in such sections. Between this membranous sheath and the fibres, I believe there is no anatomical continuity, although they are in very close apposition.

I believe the appearance first described by Boll, known as Boll's fibre (streifen), to be satisfactorily explained, by considering that the processes of the branched cells lie on the surface of the flat cells, covering the secondary and tertiary bundles. By transposing the long fibre represented in Fig. 16, and applying it longitudinally to the surface of the dark cells covering the depression between the cell-covered tertiary bundles in Fig. 11, a schema is obtained, which illustrates what I consider is the nature of Boll's streifen. The fibre actually seen lies on the flat quadrangular cells, whose free surface is towards the stellate spaces, bounding the secondary bundles, seen in transverse section in Fig. 17, Plate III. In point of fact, I have seen in teased gold preparations, part of the processes of a branched cell applied so closely to the surface of several cohering flat cells, that it is easy to see how an anatomical continuity has been supposed to exist. I have also seen longitudinal foldings on the flat cells more deeply stained than the rest of the surface, that simulate with tolerable accuracy the appearance of the elastic fibre. A distinction between these two similar effects, so differently produced, is to be carefully made.

The long narrow cells that are applied to the primary bundles may be sometimes observed to fall off the bundles, while maintaining their coherence to each other. In the same way, on examining tendon in indifferent fluids, layers of the quadrangular flat cells are sometimes found detached. From these appearances the inference is permissible, that the cells lie on a fine membrane, a portion of which in these cases is removed entire.

Whether this fine layer constitutes the whole or only a superficial stratum of the membrane that invests the bundles of connective tissue, I am not prepared to say. In regard to the membrane itself, from observations made on the primary, secondary, and tertiary bundles, I have come to the conclusion that in all of them, even the latter, it is of extreme tenuity.

On the primary bundles in tendon, hardened in weak solution of chromic acid, and cut transversely, a fine border may be seen surrounding the bundle and distinct from it. (See Fig. 12, *b.*) Evidences of it are also seen in treating morsels of tendon by warm saturated solution of potash, which sometimes dissolves the fibrillary substance, and leaves the sheath entire. Surrounding the secondary bundles, as has been already pointed out by several observers, appearances indicating its existence may be seen by the use of carmine. On the tertiary bundles its existence is easily shown, and especially in fœtal tendon of the higher mammalia. Transverse sections, treated with concentrated acetic acid, and mounted in glycerine, show two distinctly different appearances, according to the focus of the objective.

The superficial view consists of a uniform field of stellate spaces, with intermediary substance. But on altering the focus so as to bring a deeper stratum into view, we see that on the border of the preparation there is a broad band of tissue, between the edges of which the fibrillary substance is arranged, parallel to the plane of the transverse section. Fig. 12, *a*, reproduces the appearance seen at the deeper focus. With an immersion lens of high power (I used the No. 12 of Vérick, with No. 1 eyepiece), the edges of this band can be seen to consist of a membrane of extreme fineness.

The rationale of the two appearances is easily understood. The intermediary substance swells under acetic acid, while the membrane does not. Consequently the latter is covered by the substance that is swollen, and is only brought into view by lowering the focus.

It is of great importance to distinguish between the so-called elastic membrane and the elastic processes of the branched cells, and a preparation such as that reproduced in Fig. 12, *a*, is of great use in enabling us to make this distinction apparent. They differ in three ways. The elastic fibres have a peculiar glistening appearance, which the membrane has not. Secondly, they are mostly thicker. Thirdly, while the membrane is unaltered in its position by the influence of acetic acid, the elastic fibres (cell-processes) are carried upwards by the swollen substance, although they are not otherwise altered by it.

This elastic membrane is capable in certain situations of assuming more considerable proportions. I consider Descemet's membrane, and the sarcolemma of muscle, to be simply extraordinary developments of it.

They are both covered by a single layer of flat cells, and both pass continuously into the adjoining tissue. In muscle, the sarcolemma is continued into the surface of the secondary bundles of tendon, which is equivalent to saying that it is continuous with their sheaths.

The primary and secondary bundles that form a muscular fibre are well seen in osmic-acid preparations, and their direct continuation into the bundles of tendon is at the same time demonstrable. That is to say, a muscular fibre is not only directly continuous with the fibrillary substance of tendon, but the natural component bundles of the muscular fibre are continued as the natural component bundles of the tendon. This is shown in Fig. 9, Plate II.

To summarize: A certain number of the fine ultimate fibrillæ, lying in an amorphous intermediary substance, surrounded by a delicate membrane, which on its outer surface is covered by long, narrow, flat cells, constitute a primary bundle of tendon. A certain number of primary bundles are surrounded by a membrane covered with flat cells. This forms a secondary bundle (indicated by the lines of the spaces in Fig. 12, *a*), and analogous to the layer of connective tissue between two of the well-marked varicose linear spaces that are seen on all vertical sections of the cornea to divide it into compartments. These secondary bundles are grouped in large divisions—the tertiary bundles—also bounded by a membrane covered with flat cells, transverse section of which is reproduced in Fig. 12, *a*. Both the membrane of the tertiary bundles and the fascia covering the tendon consist of a double layer of flat cells separated by intermediary substance.

In the stellate spaces are the branched cells, whose processes ramify between the bundles, the analogues of the so-called cornea corpuscle (branched cell of the cornea).

It is impossible within the limits of this paper to enter into the history of the opinions lately published regarding the structure of tendon.

In the memoirs of Boll,[1] Spina,[2] and Ranvier,[3] will be found not only a record of important observations made by the authors, but very complete historical notices of the literature of the subject. On one point I think it necessary that I should state a difference that exists between the views of Spina and those above expounded. Spina has expressed his belief that the elastic tissue takes its origin on the surface of the cells, and by the cells so designated, he understands the quadrangular cells which I believe cover the membrane that invests the secondary bundles. I am of opinion that these cells have as regular a contour as for example those on the anterior surface of the corneal epithelium, and that they have nothing to do with the formation of elastic fibres. These I hold to be formed by the anastomosing processes of branched cells, which lie free in the spaces. Between the flat and branched cells here as elsewhere I make a distinction in kind.

The long narrow flat cells, which I have described above as being characteristic of the primary bundle of tendon, and below and elsewhere as covering the primary bundles in the cornea, must be considered as being coextensive with connective tissue. I have now found them in the cornea, skin, tendon, fascia, and mesentery. Those covering the bundles in the mesentery of the frog are narrow and tapering, and shorter than those found in the cornea, and as yet I have only seen them by the potash treatment. They can be demonstrated *in situ* in the cornea by the following method:—The cornea of a frog is scratched with a blunt hook, and some hours afterwards a drop of half per cent. solution of chloride of gold is placed on its surface. In a few minutes the animal is killed, and the cornea treated with gold in the usual way. If the treatment has been successful, the straight spaces known as the corneal tubes, described by Bowman, will be found occupied by parallel rows of the long cells placed end to end. Those in one place cross those in another, as is known to be the case with the corneal tubes.

[1] Schultze's Archiv, 1871.

[2] Wien. Med. Jahrb., 1873.

[3] Archives de Physiologie, 1869 and 1874.

If the staining has been intense, the rows of cells nearly touch each other, and their outlines are obscured by excess of colour. When the gold has not penetrated into all the tubes, those into which it has made its way show the cells with great distinctness. Fig. 18, Plate III., represents part of one plane of the cornea of a frog so treated; and as preparations similar to that of which it is a picture are easily obtainable by the above method, I may be allowed to express a hope that the vexed question of the corneal tubes is definitely settled. Not only are the tubes described by Bowman natural channels, but they are channels lined by flat cells.

I have obtained perfect specimens of the corneal tubes by injecting a frog from the aorta with a one-fifth per cent. solution of nitrate of silver. A deposit of silver took place in the wide channels in which the nerves lie and in the corneal tubes of the part of the cornea adjoining the sclerotic, and shows that there is an unbroken free passage for fluids from the vascular system into the cell-lined spaces of connective tissue. The capillaries of the sclerotic, coloured dark by the silver, showed no tearing of their walls.

The question of the nomenclature applicable to the subjects, about which histologists in the United States and in England are likely to write for some time to come, is an important one. It is important that the words chosen to designate particular objects should be descriptive of some general quality attributable to them; that the nomenclature be simplified as much as possible; but, above all, it is important that it is one that finds general acceptance.

In the first notice I published of those cells in the cornea, whose outlines are seen as dark lines by the use of nitrate of silver, I named them epithelial cells. It has been suggested to me by scientific authority for which I have the greatest respect, that the use of this term as applicable to these and other flat cells is objectionable; and therefore, however much from my own point of view its use seems natural and appropriate, I shall only make the following suggestions on the subject.

What name is it convenient to apply to the cells represented in Figs. 17, 18, and 19, Plate III., respectively?

The cells in Figs. 17 and 18, with other properties that they have in common, have the important one of being isolable by caustic potash, and have therefore a claim to a common generic designation. The cells in Fig. 19 present different chemical characteristics from those in Figs. 17 and 18, and have the distinctive quality of possessing processes which anastomose. It is convenient, therefore, to give them a designation which will place them in contrast with those of 17 and 18. Having reference in a general way to their form, I have proposed to designate those of Figs. 17 and 18 as flat cells, and those of Fig. 19 as branched cells, although neither those of Fig. 17 nor Fig. 18 are absolutely flat. In both of them, but especially in those of Fig. 18, cell-contents are indicated. Those of Fig. 17 and Fig. 18 might be distinguished from each other as quadrangular flat cells and long flat cells, and so on, according to their shape.

The term epithelium, which I proposed to apply to the cells of Fig. 17, would, if considered applicable, be extended to the long cells of Fig. 18, and to all the cells in connective tissue, muscle, and nerve described by me as flat cells.

What is epithelium?[1]

Brücke (*l.c.*) gives the following definition:—"Unter Epithel im Allgemeinen verstehen wir Zellen lagen, welche irgend eine äussere oder innere Oberfläche überkleiden."

Dr Michael Foster (*l.c.*) as follows:—"Epithelium itself would simply mean cells lining a cavity or coating a free surface."

Do the cells in question cover a free surface?

The simple fact of more or less flattened, unbranched cells being placed side by side (see Figs. 14–18) is of itself a presumption that they cover a free surface. That they do so is demonstrated by the results of injections natural and artificial. In the beautiful plates illustrating the work of Ludwig and Schweigger-Seidel,[2] the mass injected into tendon is seen to pass in straight lines corresponding to the cell-covered bundles, which also communicate directly with the lymph capillaries of the surface. (The facility with which this takes place will be understood by reference to my Fig. 12, *a*, Plate II.)

In Fig. 13, illustrating Schweigger-Seidel's memoir, "Ueber die Grundsubstanz und die Zellen der Hornhaut des Auges,"[3] is reproduced a preparation from an injected cornea, in which the continuity of the spaces between the primary bundles, the layers of cornea substance (analogous to the secondary bundles of tendon), and the canals in which the nerve stems lie, is clearly shown.[4] But all these spaces I have shown to be covered with a continuous layer of flat cells. (See Figs. 17, 18, and a paper in the *Lancet*, 14th February 1874.)

Natural injections of the cornea by lymph-corpuscles take place in inflammation. In an artificially inflamed cornea stained in gold and then in hæmatoxylin, the nucleus of the branched cell does not colour so deeply in the hæmatoxylin as the nuclei of the lymph-corpuscles. I possess preparations showing the space between the nerves and the cornea substance crowded with lymph-corpuscles

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[1] The cells described by many authors as endothelial I include in the general term epithelium. The word endothelium is, as remarked by Dr Michael Foster (*Quarterly Journal of Microscopical Science*, New Series, No. LV.), "etymologically pure nonsense." Brücke (*Vorlesungen über Physiologie*, s. 130), after explaining in what sense the term has been used, applies the word epithelium to designate cells that, *par excellence*, have been described as endothelial.

[2] Die Lymphgefässe der Fascien und Sehnen von C. Ludwig und F. Schweigger-Seidel. Leipzig, 1872.

[3] Arbeiten aus der Physiologischen Anstalt zu Leipzig, 1870.

[4] See also Fig. 10, illustrating Lavdosky's memoir in Schultze's Archives, 1872.

(as indicated by the stained nuclei). In the spaces so-called (*lacunæ*), while the nucleus of the branched cell is unaltered, as many as five, six, and even eight, can be counted in each space. In the corneal tubes they are indicated by parallel rows of deep-blue nuclei, whose number and close juxtaposition excludes the possibility of their being due to any inflammatory changes in the long cells.

I believe that the proof of a free surface is complete. Whether the cells which cover it may be spoken of as epithelial, I leave it to others to decide.

The term connective-tissue corpuscle, hitherto applied to the branched cells, and to such of the flat cells as have been seen in connective tissue, is, I think, objectionable, as taking no cognizance of the fundamental difference between two kinds of structure, formed on a different plan, and having essentially different functions.

NOTE ON THE BRANCHED CELLS OF THE CORNEA.

A perusal of Schweigger-Seidel's Essays on the Cornea has led me to carefully study the nature of the appearances described and figured as the cornea corpuscle. I have come to the conclusion that many of his objections to the interpretation given to these appearances are well founded. I have satisfied myself that the straight lines figured as running out in all directions from the corpuscle are, what Schweigger-Seidel describes them to be—a deposit of colouring matter in the spaces between the bundles. This seems to me to be particularly well seen in hæmatoxylin preparations. What I believe to constitute the cornea corpuscle—the existence of which Schweigger-Seidel denied—I have seen most clearly in fresh preparations. The processes are narrow and not usually straight. I reproduce a cell (see Fig. 19, Plate III.) seen in a thin horizontal section through the centre of a fresh ox's cornea. The nucleus, nucleolus, cell-protoplasma, and processes, are all distinctly seen in such a preparation. As far as I have yet observed, the processes have uniformly the appearance of the somewhat delicate fibres seen in the figure. The anastomosis is very evident. The inter-fibrillary fluid which Schweigger-Seidel states is mistaken for the processes of the cell, and a deposit in which I believe constitutes much of what is coloured in the majority of gold preparations, are in fresh preparations invisible. The small purple-coloured mass with curving thread-like processes—resembling the body and legs of a crab—sometimes seen in gold preparations, is, I believe, the branched cell. It contrasts strikingly with the figures of the cornea-corpuscle in all the text-books with which I am acquainted.

EXPLANATION OF THE FIGURES.

[I am indebted to Mr Ewart for preparing the specimens reproduced in Figs. 17 and 19.]

PLATE I.

Fig. 1.

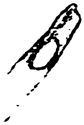


Fig. 2.

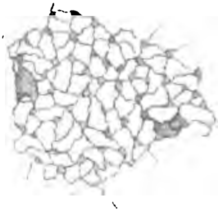


Fig. 4.

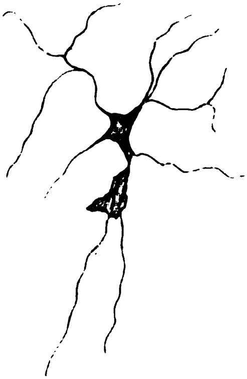


Fig. 3.

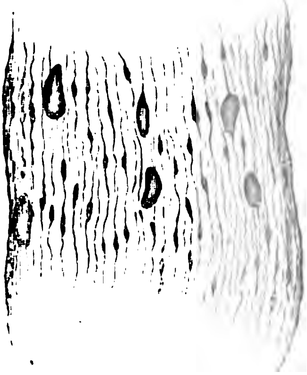


Fig. 6.

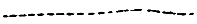


Fig. 7.

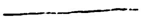
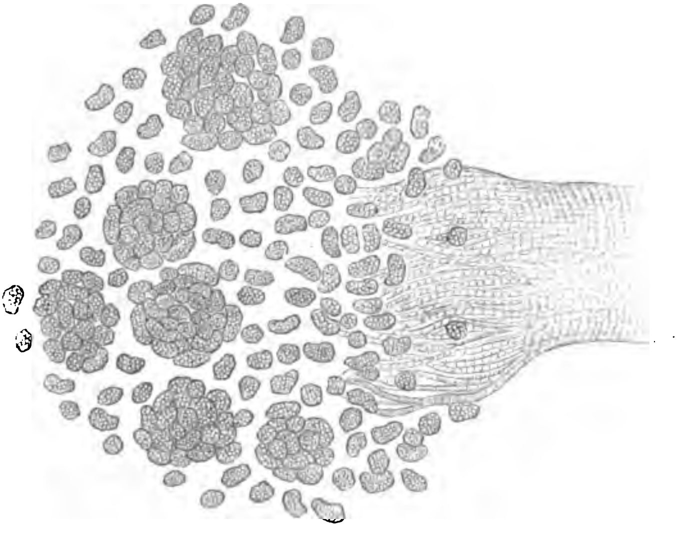


Fig. 5



J C. Ewart, delt.

W Ballingall, sc.

Plate II.

Fig. 8.

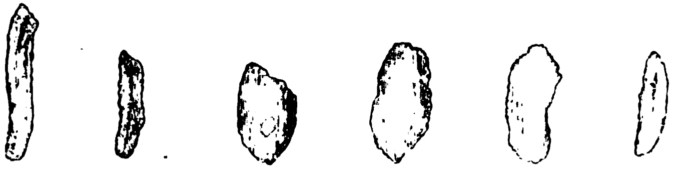


Fig. 9.

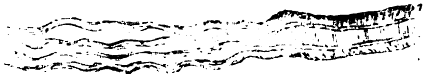


Fig. 11.

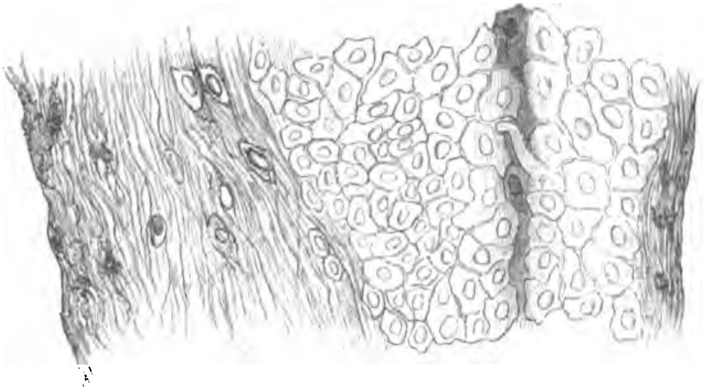


Fig. 12.

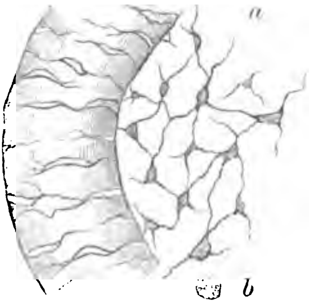
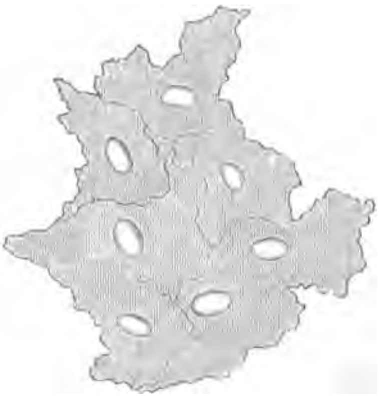


Fig. 10.



J. C. Ewart, delt.

W. Ballingall, sc.

Plate III.

Fig. 16.

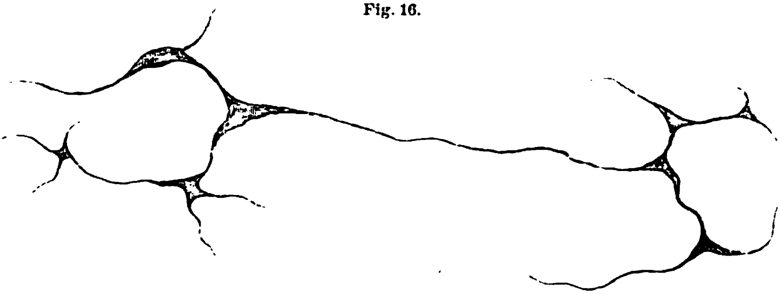


Fig. 15.

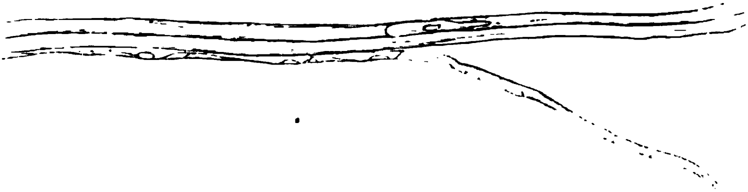


Fig. 14.

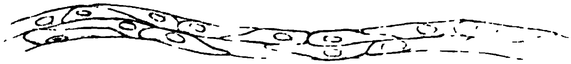


Fig. 13.

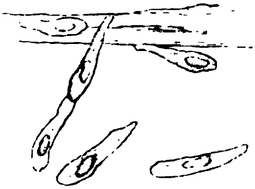


Fig. 19.

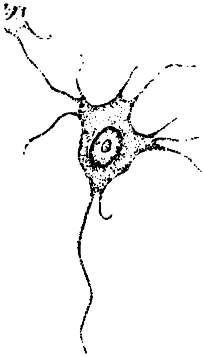


Fig. 17.

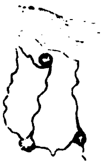
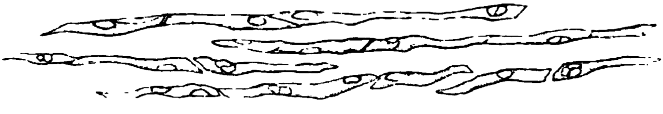


Fig. 18.



J. C. Ewart, delt. W. Ballingall

PLATE I.

FIG. 1. Cell isolated from the fibrillæ of muscular fibre of frog. Hartnack, obj. viii., eyepiece 3.

„ 2. Fragment of elastic network isolated from muscular fibre of frog. Vérick, obj. xii. (à immersion), eyepiece 1.

„ 3. Longitudinal fibres of elastic network of muscular fibre of frog. Hartnack, obj. x. (à immersion), eyepiece 3.

„ 4. Branched cell isolated from muscular fibre of frog. Hartnack, obj. x. (à immersion), eyepiece 3.

„ 5. Discs of primary bundles of muscular fibre of mouse. Hartnack, obj. x. (à immersion), eyepiece 3.

„ 6. Fibrilla of muscle of frog. Gold preparation. Hartnack, obj. x. (à immersion), eyepiece 3.

„ 7. Fibrilla of muscle of frog. Chromic acid preparation. Vérick, obj. xii. (à immersion), eyepiece 1.

PLATE II.

FIG. 8. Flat cells of muscular fibre of frog. Observed *in situ.* Vérick, obj. xii. (à immersion), eyepiece 1.

„ 9. Muscular fibre of mouse, showing continuity of primary and secondary bundles, with those of the corresponding tendon. Osmic acid preparation. Hartnack, obj. vii., eyepiece 3.

„ 10. Flat cells on surface of the tendo Achillis of frog. Nitrate of silver preparation. Hartnack, obj. vii., eyepiece 3.

„ 11. Longitudinal section through tendo Achillis of frog. (On depressing the focus, there is seen another layer of cells of similar size and form.) Gold preparation. Hartnack, obj. vii., eyepiece 3.

„ 12. *a*, Transverse section of tendo Achillis of six months' human fœtus. Hardened in Müller's fluid. Treated by acetic acid. Hartnack, obj. x. (à immersion), eyepiece 3.

„ 12. *b*, Primary bundle from transverse section of tendo Achillis of 14-inch sheep fœtus. Contour supposed to indicate the sheath of the bundle. Chromic acid preparation. Hartnack, obj. viii., eyepiece 3.

PLATE III.

FIGS. 13, 14, and 15. Cells and primary bundles of tendo Achillis of 14-inch sheep fœtus. In Fig. 15 the cells are seen falling off the bundle in a coherent mass. Chromic acid preparation. Vérick, obj. xii. (à immersion), eyepiece 1.

„ 16. Branched cells from tendo Achillis of frog. Gold preparation. Hartnack, obj. vii., eyepiece 3.

„ 17. Quadrangular flat cells of the cornea of the hen. Nitrate of silver preparation. Hartnack, obj. vii., eyepiece 3.

„ 18. Long flat cells of the primary bundles of frog's cornea, forming the free surface of the corneal tubes. Six hours' inflammation, produced by scratching (see division of nuclei). Gold preparation. Hartnack, obj. vii., eyepiece 3.

„ 19. Branched cells in transverse section from centre of ox cornea. Fresh. Vérick, obj. xii. (à immersion), eyepiece 1.

Part Second.

REVIEWS.

Surgical Inquiries: A Presidential Address delivered at the Annual Meeting of the Birmingham and Midland Counties Branch of the British Medical Association, 24th June 1874. By FURNEAUX JORDAN, F.R.C.S., Surgeon to the Queen's Hospital, Professor of Surgery at the Queen's College. London: J. and A. Churchill: 1874.

WE know of no surgical writer at the present day whose communications are more thoroughly replete with originality than those of the gentleman whose name appears as the author of the present brochure. Thrown together as its elements have been in the leisure of active professional occupation, they present as great diversity of subject and treatment as could well be imagined; but with this much in common that through them all there is the same token of genius in every conception and in every suggestion.

That the subjects of observation and remark are sufficiently varied the following list will abundantly prove:—

"Cellular Pathology; Skin Grafting; Continuity in Pathological processes; Continuity in Pathological action in the implication of tissues; Syphilis; Gonorrhœa of the Umbilicus; Struma; Shock; Wens; Unusual Abscesses; The treatment of Inflammation; Case of Enucleation of Myeloid Tumour of the Lower Jaw; Diseases of Joints; Excision of the Knee; A mode of Amputating at the Knee-joint; Spinal Caries; Proposed operation in hopeless cases of Spinal Caries; On the Evacuation of Fæces and Retention of Urine in Cerebro-spinal Lesions; An operation for Nævus of the Face; Nævoid Hypertrophies; Nævus of Bone; Proposal for the treatment of internal Aneurism; Bubo within the Abdomen; Irregular Distribution of the Lymphatics; On Ligature of the Common Carotid in Rupture of the Middle Meningeal Artery; On the origin and treatment of Bronchocele; Case of remarkable Thyroid Cyst; A method of removing the Tongue; A method of restoring the Entire Lip, upper or lower; A proposal for the radical cure of Hernia; A simple extraperitoneal operation in Strangulated Hernia; An operation for Stricture of the Rectum; A simple plug for Rectal Hæmorrhage; An operation for Phymosis; The results of congenitally small Meatus Urinarius in the male; An operation for the treatment of impassible Stricture and Retention of Urine; The treatment of Vesical Calculus in the female; Sounding for Vesical Calculus with a long needle in Traumatic Stricture; Inflammation extending from the Epididymis to the

Urethra; The radical cure of Encysted Hydrocele of the Cord; The operative treatment of Cystocele and Rectocele; The incisions in removing Cancer of the Breast."

Not only are the subjects varied, but each almost has its illustrative diagram, by which the book is rendered strikingly demonstrative.

Such a rich mine of rare gems, each one coruscating with the practical genius of the writer, evinced in the ingenious speculations which have occurred in connexion with common enough facts certainly, but facts which, from their very plainness and everyday occurrence, might at first sight seem hardly to merit the notice of one who has penetrated deeply into the very arcana of surgical art and science, may well encourage every one to look around him, and to watch the strange combinations, the anomalous progress, and the incalculable results which may be observed to be inherent even in the simplest object of professional study.

No work of like bulk and so unpretentious an exterior will be found more thoroughly to repay, even to the very busy practitioner, the time expended upon its careful and thoughtful consideration.

We wish this work all success, and feel assured we will receive the grateful thanks of every reader for directing his attention to this writer, and to all his publications.

Etudes d'Histologie Pathologique dans la Folie Simple. Par M. le Dr AUGUSTE VOISIN, Médecin à la Salpetrière. Bordeaux.

Manual of Lunacy: A Handbook relating to the Legal Care and Treatment of the Insane in the Public and Private Asylums of Great Britain, Ireland, United States of America, and the Continent. By LITTLETON S. WINSLOW, M.B. & M.L. Cantab., M.R.C.P. Lond., D.C.L. Oxon. London: 1874.

Insanity in its Relations to Crime. By WILLIAM A. HAMMOND, M.D. New York: 1873.

The Chicago Journal of Nervous and Mental Diseases. Edited by J. S. JEWELL, M.D., etc., and H. M. BANISTER, M.D. January 1874, No. 1. Chicago, London, and Edinburgh: Williams and Norgate.

Maclachlan and Stewart's Pathological Charts. No. 1. The Brain.

IN this short pamphlet, the distinguished author, Dr Voisin, gives some of the results of his observations on cases of insanity examined by him after death. He seeks for the primary lesion in alteration of the vessels of the nervous centres, and he observes that he has never yet made an autopsy of an uncomplicated case of insanity without meeting with morbid alterations in the vessels, if the disease had gone on for three months. Dr Voisin treats the alterations in the nervous tissue as following those of the vessels, at least in this form of insanity. "There is," he writes, "at first dyscrasia, then diminution, then suppression of the nutrition of the cells, and at last a true gangrene of the nervous tissues. In the end, we have a real necrosis of the cerebral nerve-cell. It loses its colour and shape, contracts, and becomes isolated, a true foreign body in the nervous substance." The history and post-mortem examinations of six cases are given with masterly brevity, and illustrated by two pages of engravings. The pamphlet is reprinted from the Transactions of the French Association for the Advancement of the Sciences, held at Bordeaux in 1872.

Dr Lyttleton Winslow's Manual of Lunacy is a useful book, where medical men who have to do with the subject may find many things easily which would cost them much pains to find elsewhere. At the same time, we do not see how the claim can be fairly made, as stated in the preface, that it "fills a gap in medical literature," as no medical practitioner can now plead ignorance of the law as regards lunacy. The law of lunacy as regards medical men is very clearly laid down in the handbook of Sabben and Browne, published no later than 1872, which is too good a book to be thus ignored. Dr Lyttleton Winslow, who is a son of the late Forbes Winslow, well known by his learned works on insanity, begins by giving a short history of lunacy legislation, and then describes the present state of lunatics in England and the laws relating to them. We have then chapters on lunacy in Scotland, Ireland, France, Germany, Belgium, America, and Russia. These are full of special and interesting information. The author asks his readers to point out any errors or omissions with a view to the correction of future editions. We cannot say that we have noticed any, save that the Roxburgh and Berwick Asylum, stated in the book to be at Milholme House, Musselburgh, was shifted in the summer of 1872 to the new Asylum at Melrose.

In reference to the history of lunatic asylums, if Dr Winslow will consult the memoirs of Bulstrode Whitelocke, the celebrated statesman in the time of the Commonwealth, written by Professor Whitelocke, he will find that during the reign of Charles I., there was a private asylum in England, kept by a doctor, where Whitelocke put his first wife, who was afflicted with epileptic mania.

The name of Dr Hammond is sufficient to call attention to his little treatise on Insanity in its Relation to Crime, though the learned Professor has, in imitation of the Germans, added a long list of the honorary titles he has gained, which are arranged by the printer in the form of a saucer on the titlepage of the work.

Dr Hammond gives a number of striking cases, principally from French sources, most of which have already done service in essays on similar subjects. The reader will readily forgive us if we do not launch into the interminable subject of insanity in its relation to crime—a subject on which medical men have in our opinion written a good deal of nonsense. Dr Hammond is far from wishing to plead cerebral disease as a bar to punishment for crime. He takes, indeed, the opposite side, and his little book is well worthy of being read by those who imagine that a knowledge of pathology, or an acquaintance with the symptoms of insanity, entitle them to propose changes in the law. "With all our care," he remarks in a closing sentence, "injustice to some extent will attend on every legal process, and the attempt by man to reconcile the principles of abstract right with the customs, the obligations, and the necessities of society, will always be a vain effort."

The *Chicago Journal* contains a very good *résumé* of what has been recently done to throw light upon the anatomy, physiology, and pathology of the nervous system all over the world. If the succeeding numbers be as good as the first, this new quarterly deserves hearty support. It is amazing to see, coming from a new town in America, half of which was lately burned down, so matured and scholarly a retrospect of papers, published in every language used by civilized nations, and collected from hundreds of periodicals.

Maclachlan's Charts are taken from Quain's Anatomy and Turner's paper on the Convolutions of the Human Cerebrum. The engravings are twenty-six in number, and are meant to represent all the different aspects in which the brain and its parts may be viewed anatomically, but there is no engraving of the convolutions of the brain overlying the cerebellum, which, nevertheless, are not unfrequently diseased. If, in a section, a lesion difficult to describe is found, the appearance may be readily indicated by different colours on the corresponding diagram on the chart, which may be had for sixpence. We believe this plan has been long used by Dr J. C. Howden of Montrose Asylum, who with Dr J. B. Tuke has taken the trouble to edit this useful paper.

Contributions to Practical Surgery. By GEO. W. NORRIS, M.D., late Surgeon to the Pennsylvania Hospital, etc. Philadelphia: Lindsay and Blakiston: 1873.

DR NORRIS has collected in this volume his surgical essays which originally appeared some years ago in the *American Journal of the*

Medical Sciences. The objection to the work is, that in many particulars it is not up to date. The value of the work consists in the carefully-prepared statistical tables on the results of operations on the larger arteries, drawn from all sources, and the tabulated results of the fractures and dislocations admitted to the Pennsylvania from 1830 to 1850. Statistics are also given of the cases of amputation in the same hospital from 1850 to 1860. These latter will always be of value, and we think that Dr Norris has done well to publish them in this collected form. A paper on Compound Fractures has been added, which, as far as we can gather from the preface, has never been published before. It surely cannot have been written last year, because the antiseptic treatment of these cases is not even referred to. Water-dressing and poultices seem to be the perfection of treatment in Dr Norris's opinion. The statistical tables and historical references are the valuable parts of this book, and as a book of reference we recommend it to students of surgery.

Papers on Leprosy, read before the Grant Medical College Society. By J. C. LISBOA, Graduate of Grant Medical College. Bombay: 1874.

Report on Leprosy and Leper Asylums in Norway. By HENRY VANDYKE CARTER, M.D. Lond.; Surgeon-Major H.M.'s Bombay Army. Presented to the Secretary of State for India in Council, November 1873. London: 1874.

THESE works on leprosy, for which I am indebted to the kind courtesy of the authors, suggest the following brief remarks:—

About the year 1850, the researches of Drs Danielssen and Boek on leprosy in Norway became known to the profession in India. At that time I was teaching medicine in Bombay, and daily visiting the leper ward in my hospital.

Conscious that an advantageous field for the clinical study of leprosy had been disregarded by me, and that for various reasons there was little prospect of my being able to turn it to good account, I proposed to Mr Lisboa, at the time attached to the hospital, that he should take charge of the leper ward and engage in the investigation of the disease. In February 1852, Mr Lisboa read his "Observations on Leprosy" before the Grant College Medical Society; and a full abstract of the paper was published[1] in 1854; from which nine of the illustrative cases were quoted by me in the first edition of my "Clinical Researches." Mr Lisboa has now published in a separate form a complete edition of his original paper, and has annexed an additional contribution to the literature of leprosy: these constitute the pamphlet now before me.

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[1] Transactions of the Medical and Physical Society of Bombay for the year 1854. No. II., New Series, p. 290.

The twenty-six cases which were the subject of Mr Lisboa's study in 1857 were, for the most part, in the advanced stages of the disease. The symptoms, both of the anæsthetic and tubercular forms, are carefully described, and an occasional blending of the two is noted. The presence of vesicular, pustular, and squamous eruptions, with their consequent discharges and incrustations, is mentioned in reference to a right understanding of the phenomena of the disease, and of the methods and results of treatment. Mr Lisboa, so far as I am aware, was the first observer who had shown, that though the shortening and disappearance of the fingers and toes, carpus and tarsus, are sometimes caused by caries and necrosis, they are more generally, at all events in the anæsthetic variety, effected by a slow and gradual process of interstitial absorption of the osseous tissue. The attendant phenomena of this process are minutely described, and the result is well shown in preparations presented by Mr Lisboa to the Museum of Grant College, and which form, he believes, the subject of plate 3, annexed to Dr H. V. Carter's paper[1] on the "Symptoms and Morbid Anatomy of Leprosy."

In only one case is there a report of the post-mortem appearances. Mr Lisboa did not find the state of the spinal cord described by the Norwegian observers. He noted, however, that the gray matter of the cord was very pale, but he inclines to the opinion that a similar condition probably exists generally after death from chronic exhausting disease.

My observation of leper establishments in Calcutta, Madras, and Bombay, had taught me that the accommodation and arrangements usual in such institutions were altogether inadequate for the comfort and wellbeing of those afflicted with this sad disease. The system followed in the Madras Asylum was much in advance of the others; and before finally leaving India in September 1859, I placed in the hands of Dr Bhau Dajee[2] the reports of that institution, for which I had been indebted to the kindness of Dr Alexander Hunter, the officer in charge; and proposed to him, as an object worthy of his well-known zeal and philanthropy, the establishment and endowment, with the aid of his fellow-countrymen, of an institution in the proximity of Bombay, arranged in such manner as to minister to the comfort and the cheerfulness of this unfortunate class of sufferers.

After 1852 no progress was made in the clinical study of leprosy in Bombay till about 1860, when Dr Henry Vandyke Carter entered upon his laborious and valuable researches in the same field in which Mr Lisboa had observed, and published the results, as already stated, in the Transactions of the Medical and Physical Society of Bombay for 1862. These results are derived from the study of 186 cases of hospital and dispensary patients. Of these, thirty-two cases are detailed; and the morbid anatomy of sixteen cases—eight anæsthetic, seven mixed, and one tubercular—is tabulated with great minuteness and care. The symptoms of the anæsthetic, tubercular, and mixed forms are described with much fulness. The cases which came before Dr Carter in dispensary practice suggestéd the belief that there is an early recognisable stage of the anæsthetic form marked by an eruption chiefly papular —not, however, special in character—arranged in patches various in form, size, and situation, and preceded, accompanied, or succeeded by central anæsthetic spots. This is very probable, and it forms a most essential and important part of the clinical history of leprosy in India; but there is need of further careful study in good fields of inquiry. There should be established a sure diagnosis of the papular and other forms of cutaneous disease common to ordinary asthenic states and the cachexia of leprosy; not altogether derived from observation of cases in the conditions of doubt, but confirmed by a knowledge of their after-history and progress.

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[1] Transactions of the Medical and Physical Society of Bombay for 1862. New Series, No. VIII.

[2] Clinical Researches on Disease in India, 2d edition, p. 696.

Dr Carter did not find the state of the cerebro-spinal centres mentioned by Danielssen and Boek, but he has described with greater minuteness the microscopic morbid appearances presented by the peripheral terminations and in portions of the nerve-trunks in the proximity of the affected parts. There was a clear gelatine-like deposit between the nerve-tubules in the scanty inter-tubular matrix, in which nuclei and subsequently fibres are developed, and which itself may become fibrillated. This deposit leads to a gradual disappearance of the nerve-matter in these situations. He thus established a close connexion between the morbid anatomy and the anæsthesia, the muscular rigidity and paralysis, the atrophy of tissue, and the liability to cutaneous disease.

Thus so far we find a cachexia characterized by exudation-deposit in close relation with and destructive of the terminal parts of nervous tissue, on the surface of the corium (bullæ), and into its substance (tubercles).

Dr Carter, in his very interesting account, just published, of leprosy in Norway, states, that though the forms of the disease in that country are identical with those in Bombay, their relative ratios are different. In Norway, the tubercular is 70, the anæsthetic 30 per cent. of the whole; in Bombay, compared with Norway, the anæsthetic form is twice as frequent. The tubercular form in Norway is of shorter duration and more characterized by febrile exacerbations, caused, it is believed, by the re-absorption of softened leprous matter from the skin-tubercles and its re-deposit in internal organs, as the liver and the spleen. The latest researches of Dr Hansen point to the probable existence of minute organisms in the leprous matter.

The theory of the re-absorption of the softened matter of the tubercles is of interest in connexion with the effect produced by the external application of gurjun-oil[1] in softening or converting the tubercles into bullæ; or, in other words, transforming the characteristic feature of the tubercular into that of the anæsthetic form. I am not aware whether it has been demonstrated microscopically, that the contents of the bullæ are identical with the matter of the softened tubercle. If it be so, and if the idea of re-absorption and re-deposit in the tubercular form be accepted, we have, in the external discharge of the contents of the bullæ, an explanation of the less degree of severity and of internal deposit in the anæsthetic form; and in the reported action of the gurjun-oil, we have possibly a key to the method by which remedies applied externally may act favourably—viz., the conversion of the severer into the milder form, by prevention of re-absorption and re-deposit of leprous matter.

The condition of the blood in leprosy has yet to be studied, for Drs Danielssen and Boek only remark that the albumen and fibrine are in excess, and Dr Carter has noted nothing peculiar in its appearance. The discovery by Dr Lewis of a hematozoon in the blood of persons affected with chylous urine in India has a manifest bearing on this question, and doubtless this skilful observer will direct his attention to the blood in leprosy and other forms of cachexia in India.

The Report published by the Royal College of Physicians of London iu 1867, on proceedings respecting leprosy initiated in 1862 by request of the Secretary of State for the Colonies, contains full summaries of information, communicated from all parts of India, in reply to the queries of the College. These show the prevalence of the disease in all parts of India, and the general knowledge possessed of it in that country: not, it should be remembered, proceeding from methodized research, but from the general impressions of routine observation and practice.

In 1867, a nominal return of all known lepers in the Bombay Presidency—giving the residence, sex, age, and hereditary predisposition, if any, of every affected person—was procured by the Government. These returns, digested and elaborated with great industry by Dr H. V. Carter, form the subject of an exhaustive Report,[2] published in 1871.

It may be well to explain what I conceive to have been the agency employed in collecting the information embodied in these returns. The queries, or tabular forms, were probably passed by the Secretary of Government to the divisional Revenue Commissioners, thence to the Zillah collectors, from them to the district assistant-collectors, then to the native mamlutdars, to be by them distributed to the village koolkurnies (accountants), who, in association with the village patéls (headmen), unlettered men, would, after communication with each individual leper, endeavour to ascertain and record, to the best of their untutored ability, the information required. Such is the theory of this kind of inquiry, which, even if faithfully worked out, hardly promises data for important practical etiological and sanitary conclusions.

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[1] Treatment of Leprosy among the Convicts of the Andaman Islands, by Surgeon-Major J. Dougal.—Edinburgh Medical Journal, July 1874.

[2] Transactions of the Medical and Physical Society of Bombay for the year 1871, No. XI., Second Series.

Dr Carter has been led by these returns, and other collateral sources of information, to the conclusion that leprosy is not caused and maintained by endemic or defective hygienic conditions, but mainly, if not exclusively, by hereditary taint; and that the decline and ultimate disappearance of leprosy in Europe in the middle ages were due to rigid segregation in lazar-houses, and that, in order to the eradication of the disease from India, a similar principle should be applied. Dr Carter, in his late visit to Norway, found that the same views existed there. He says, in his Report (p. 24), "In fact the original investigators of the national plague in Norway came to the unanimous conclusion that the main cause of the perpetuation of leprosy is its transmission from parent to offspring. I had come to a precisely similar conclusion for Western India." "Hence the ratio agendi of asylums: they serve for sequestration of the possible parents of a diseased offspring, and thus directly check the propagation of an inherent malady. From the nature of the case no other plan can be effective, for time and due perseverance being granted, the aim of eradicating the morbid taint must inevitably be successful."

In this exclusive view I do not concur. That hereditary predisposition exercises an influence in the propagation of this cachexia as it does in that of several others, and that the social lesson thereby taught should be carefully inculcated and observed, may not be questioned.

But this predisposition is, I believe, a factor subordinate to endemic and defective hygienic conditions, the precise nature of which has yet to be learned by right methods of investigation conducted by a competent agency. Social feeling and custom offer an influential obstacle to the marriage of lepers in India. The death-rate of the afflicted is high—10 per cent. and upwards.

These conditions, which imply an excess of deaths over births, would, if leprosy be mainly perpetuated by inheritance from parent to child, necessarily lead to the gradual extinction of the disease in the natural course of events.

It is very probable that the law of excess of death-rate has kept leprosy in check; but in the fact that it has not brought about its marked diminution and extinction, we have evidence that there are other active factors in its causation besides hereditary taint. The more precise but still immature statistics of Norway point to the same conclusion. Within the last five years[1] in that country the death-rate of leprosy has exceeded the birth-rate by 100 annually. This, however, Dr Carter would seem to attribute to the enlargement and more perfect organization of the four leper asylums of Norway, commenced in 1856; but there are no trustworthy statistics prior to 1856 for comparison; and this opinion is also apparently inconsistent with other statements in the Report. Not that it need be questioned, that the tendency of the segregation of—as in Norway—one-third of the known lepers of a country would be, under the ordinary estimate of predisposition, to lessen the amount of the disease; but in order to make this appreciable, there should be data, which do not appear in this Report—as the proportion of married inmates in the asylums, their average age at the time of admission, the duration of residence, the number of their children before admission and the proportion of these which has become leprous, etc.

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[1] Dr Carter's Report, pp. 24, 25.

With a view to useful practical action in respect to leprosy in Bombay, the following statements are made with some confidence:—

1. More careful clinical study of the early stages is required in reference to diagnosis, etiology, and treatment; and this may be best conducted in connexion with existing hospitals and dispensaries.

2. Leprosy is characterized by exacerbations and remissions: the former are aggravated by all conditions that debilitate and deteriorate the constitution; while the latter become greater in degree, and more extended in duration, by all conditions of hygiène, regimen, and treatment, which strengthen and improve the constitution. This law appears not only in Indian experience, but also in the instructive Report communicated in 1872 to the Secretary of State for the Colonies, on Leprosy in the West Indies, by Dr Gavin Milroy.

3. Much of the loathsome character of leprosy is due—in addition to the general causes of exacerbation—to neglect of the various appliances which mitigate the course of the local degenerations characteristic of the disease, and alleviate the cutaneous vesicular and pustular complications.

4. If 2 and 3 be true, it follows that the provision, for those afflicted with leprosy in its confirmed stages, of suitable resorts, in healthy positions, with means of recreation and occupation, and appropriate hygienic adjuncts and medical appliances, is a measure in which the Government and the charitable community of the presidency may without delay engage—with the certainty of effecting great and extensive alleviation of human suffering, and the gradual extinction of the more loathsome aspects of the disease. The success which attended the use of gurjun-oil in the hands of Surgeon-Major J. Dougal—already referred to—under the most unfavourable circumstances, affords ample evidence of what may be expected from the application of similar principles in association with hygienic and other kindred advantages. Large expensive

palatial structures are not proposed, but institutions on the cottage principle, with ground sufficient for gardening, and other industrial pursuits and amusements suited to the different classes of inmates. The medical officers in charge, by systematic investigation and record of the previous history of the inmates, would gradually accumulate facts, which would lead to a more certain knowledge of the etiology of the disease.

5. The districts, and towns, and villages in which leprosy chiefly prevails, should be visited by competent medical officers, with the object of studying the hygienic and social conditions of the affected, and of the locality generally, and of instituting statistical methods of record. Information thus acquired, and considered in connexion with the etiological data resulting from clinical study by officers in charge of leper asylums, would in time lead to a more positive knowledge of the causes of leprosy, and a consequent more certain application of the true means of prevention.

In conclusion, Dr Carter, believing that leprosy is chiefly maintained by hereditary descent, would aim at stamping it out by a well-organized system of segregation.

Whereas I, believing that there are other more powerful factors than family predisposition, would aim at the immediate alleviation of much present individual suffering, and the removal of public offence, as well as at the future prevention of the disease by a perfect knowledge of its causes acquired by scientific methods and a qualified agency.

I cannot close these hurried and imperfect remarks without desiring to express the great pleasure I have experienced in having thus been led to a just appreciation of Dr Carter's labours and high qualities for scientific research, and of their harmony with that early promise which it was my privilege to have personally known.

C. MOREHEAD.

Tropical Debility. By JAMES G. DICKINSON, late of H.M.'s Bengal Medical Staff, etc. London: Baillière, Tindall, and Cox: 1874.

WE learn from various foot-notes, and from the advertising sheet annexed to the pamphlet of thirty-eight pages now before us, that Mr James G. Dickinson is, in addition to this "Treatise on the Causes and Treatment of Debility produced by long residence in the Tropics," also the author of several other small works of kindred tenor, either published, "in the press," "preparing for publication," or "nearly ready."

Though the present treatise is professedly written "at the request of many professional friends practising in many parts of England," it seems to us to be chiefly intended for the general public, for it is strongly flavoured with that peculiar style of thought and of diction

which tends to alarm the reader and to magnify the writer, and which hardly comes within the sphere of pure medical criticism.

The best original observers of disease in India are satisfied with the simple principle that tropical etiology differs from that of temperate countries, in that, superadded to the causes of disease present in both, there is the influence of elevated temperature and of malaria, and that these are factors of an anæmic state of constitution additional to the other various factors of this state common to all countries. Further, that the malarious influence gives a character of periodicity to Indian disease generally, which it is important to remember in diagnosis and treatment.

The existence of these additional factors of anæmia leads to this practical conclusion, that the immature in constitution of both sexes, and the aged, are not well suited for warm and malarious climates, and that the European who has been long resident in India, in journeying to Europe, should select the season of arrival, and afterwards regulate his clothing and general management, so as to avoid the risks of chill, with their consequent congestion of organs predisposed by diathesis or previous disease. He should further remember that his constitution, debilitated by long residence in the tropics, is not in good training for constant travelling from place to place and restless sight-seeking, and, unless there be some good special reason, is unsuited for courses of eliminating mineral waters and summer residence in the sultry valleys in which Continental spas are chiefly located.

It may be added, that neither writers on Indian disease or Indian sanitation, nor the English community, professional and general, sufficiently bear in mind the geographical extent of India, the variety of its climates and its seasons in their relation to health, and that now it is sufficiently common for the long resident to have passed much of his time in healthy localities, and that it is an anachronism which serves no useful purpose incessantly to reiterate the traditional dramatic description of the retired Indian officer—with a sallow face, an enlarged spleen, and the liver of a Strasbourg goose.

We do not share the apprehension which forms the staple of the pamphlet under our notice—that an experienced and competent physician in this country can have any difficulty in treating tropical invalids. He has simply to note the degree of the anæmia, and by inquiry into the previous history of health and of residence of his patient, to form a judgment of its cause, then to examine into the condition, structural and functional, of all the organs, more especially of those likely to have suffered; and then to apply the ordinary principles of regimen and therapeutics. This, no doubt, presupposes some knowledge of the general physical geography and climatology of India, but not more than every competent physician should, and we believe does, possess.

Five Years' Surgical Work in the Manchester Royal Infirmary. By EDWARD LUND, F.R.C.S., one of the Surgeons of the Hospital, etc. Manchester: J. E. Cornish.

WE welcome Mr Lund's hospital experience. He has carefully tabulated 1309 cases treated in his wards from 1867 to 1871. This is the first record of any importance, and extending over a considerable period, of cases treated in a large hospital on strict antiseptic principles.—Will none of the other surgeons in the same infirmary, who do not use antiseptics, give us an account of their stewardship, for the sake of comparison? These statistics may be compared with those of other hospitals, but such comparison cannot have such weight as a comparison with cases treated in the same hospital during the same period. The time has now come when surgeons desire a statement of the practical results of antiseptic management. "Laboratory antiseptics"—flasks and infusions—have done their work. "Bedside antiseptics" must now furnish their share, and show the surgical world the *practical* value of the careful use of means to prevent putrefaction in wounds.

The great trouble Mr Lund has had, in carefully compiling these statistics from notes taken at the bedside in his own hand, will, we feel sure, be appreciated by every reader of the work. We have not space to refer *seriatim* to the tables, but they are, in our opinion, worthy of perusal on account of their accuracy, and because *every case* is given, with the result, good or bad. Our only wish is, that his explanation of the tables at page 3 had been clearer. The book is full of many good practical hints. While a firm believer in the value of carbolic acid as an antiseptic, he points out its dangers as an irritant on some tender skins, and the dangers from absorption of carbolic acid into the system when injected into cavities—rare cases, which in no way interfere with the general usefulness of the remedy. Finally, we must congratulate Mr Lund on treating 45 cases of compound fracture with only 5 deaths, and on 2 successful cases of amputation at the hip-joint.

Hereditary Syphilis. By THOMAS BALLARD, M.D.

Rare Cases of Congenital Syphilis. By L. DUNCAN BULKLEY, A.M., M.D., New York.

THE first pamphlet is an attempt to disprove the existence of congenital syphilis. The author considers the so-called syphilitic eruptions of infants to be the result, not of an inherited taint, but of the external irritation of urine, fæces, and dirty napkins. Dr Ballard seems to think it unnecessary to touch on the important subject of visceral syphilis in infants, probably because these latter symptoms are beyond the range of his "dirty napkin" theory.

Nothing of the least weight is brought forward to refute the almost universal belief in the highly contagious properties of congenital syphilis. If such opinions took the least root in the medical mind, a large increase of acquired syphilis would certainly result, through want of care in the nursing of syphilitic infants.

The second pamphlet contains some interesting and well-authenticated cases of the rarer forms of congenital syphilis. Amongst them are two cases of *dactylitis syphilitica*, and a non-syphilitic case of the same disease.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LIII.—MEETING X.

Wednesday, 15*th July*.—Dr MATTHEWS DUNCAN, *and afterwards* Dr WATSON, *in the Chair*.

I. Exhibition of PATHOLOGICAL SPECIMENS, etc.

Dr P. H. Watson showed—(1.) FIBROMA OF THE ABDOMINAL PARIETES lying between the muscular structures and peritoneum.

(2.) BONES OF CARPUS excised by single linear incision over the radial aspect of the carpus to the outer side of the extensor tendons. The entire carpus and base of the metacarpal bones were removed *en masse* (with the exception of the pisiform bone), and thereafter the ends of the radius and ulna.

(3.) A LARGE FATTY TUMOUR, removed from the region of the malleoli of the right limb, which extended behind the whole of the flexor tendons of the ankle, bulging thence in three different directions in the form of separate swellings.

(4.) TUMOUR FROM THE FIRST INTERSPACE OF THE FOOT, WITH ISOLATED NODULES OF A LIKE KIND. The characters of the tumour were those of delicate fibrous structure with rounded masses, to the naked eye resembling corpora lutea, scattered throughout it, which under the microscope was found to consist of granular fatty matter.

(5.) A FOOT, from which Dr Watson had removed the astragalus, ends of the tibia and fibula, and afterwards the scaphoid, cuboid, and three cuneiform bones. A fibro-osseous structure occupied the hiatus resulting from this operation.

(6.) A LARGE OVARIAN CYST, removed three weeks ago through a limited incision in the linea alba. The pedicle was transfixed with a needle, carrying a double ligature of strong China gut.

(7.) AN EPITHELIOMA FROM THE LEG, removed by the galvano-caustic apparatus of M. Trouve of Paris. The apparatus was also shown.

II. *Dr G. W. Balfour* then made the following statement:—On 15th November 1871, I read to this Society an account of seven cases of diabetes mellitus, treated with more or less success by a diet of skim milk and animal food, accompanied by full doses (ʒiii. to ʒix. daily) of lactic acid;[1] and I am now prepared to supplement that statement by a history of the result in many of these cases.

Case 1 was phthisical, and died while under treatment, as noted at the time, after considerable improvement, which lasted three months.

Case 2. David Hume, aged 53, came under treatment weighing 8 stone 8 lbs., and after four months' treatment left, weighing 11 stone; three months subsequently he presented himself at the Infirmary, still fat and well, weighing 12 stone 3 lbs., using a mixed diet, and his urine free from sugar. He has not since been heard of, and is not known at his former address.

Case 3. Mary Early, aged 15, when first seen weighed 4 stone 11 lbs.; after four months' treatment, she weighed 5 stone 10 lbs., but was unable to take mixed diet without a reappearance of the sugar. She left improved, but returned about a year after, worse; again improved, and was discharged, and was finally readmitted in October 1873, still labouring under diabetes, and again much emaciated. She died a few days after admission from gangrene of the lung, apparently induced by cold caught on her journey to the Infirmary.

Case 4. A. M., aged 25, improved greatly, but was wholly lost sight of after only two weeks' treatment.

Case 5 was benefited by the treatment, but had to be dismissed for neglect of rules.

Case 6. M. W., aged 17, weighing 5 stone 2 lbs., continued to improve in health and weight for many months. She first came under treatment on 3d November 1871, and a year afterwards she had gained one stone and a half, having in the meantime passed through an attack of smallpox, and also one of acute rheumatism: the latter not only came on while she was using the lactic acid, but was also recovered from without the acid being given up. While on her diet of milk, meat, and green vegetables, her urine kept free from sugar, but she was unable to use any starchy article of diet without a recurrence of sugar in her urine. She subsequently became phthisical, and died last winter.

Case 7. R. A., aged 35, weight 8 stone 11 lbs. Improved very much under treatment, gained about a stone in weight, and kept free from sugar as long as he avoided any dietetic imprudence; he led an active and exposed life, and died about a year after coming under observation, from an attack of pneumonia caught while on a journey.

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[1] Published in the Edinburgh Medical Journal for December 1871, p. 533.

All of these were very serious cases from the first, and the great improvement which they all made under treatment, and the apparent cure of one of them, seems a sufficient guarantee of the importance of lactic acid as a treatment for, at least, a certain class of diabetics; viz., those in which the disease or its more important symptoms depend upon diminished combustion, characterized by weakness, emaciation, and a low temperature. I have treated many other patients in the same way, always with a certain amount of success, and in some the success has been very gratifying. The fact that the girl Wilson (Case 6) got rheumatism while using the lactic acid would seem to confirm Dr Foster's view, that there is a risk of this treatment inducing that disease; but, on the other hand, her recovery from the rheumatism without giving up the acid, proves that in her case the rheumatism and lactic acid were not connected as cause and effect, the disease being merely an accidental occurrence coincident with the use of the acid, but not dependent upon it. I myself have never seen rheumatism dependent upon the use of the lactic acid, but I have been informed of one case, besides those recorded by Dr Foster, in which this disease invariably occurs whenever the acid has been used for only a short time, so that this effect of the acid seems to be real in certain constitutions, which must, however, be of rare occurrence. There is another form of diabetes characterized by increased transformation of glycogen within the liver, which goes on even when the patient is restricted to an exclusively flesh diet. Such patients have a normal temperature, and maintain their plumpness and ruddy countenance long after they have displayed unequivocal symptoms of this most serious disease. But the increased transformation of glycogen into sugar in the liver is believed to depend upon a relative increase in that organ of the blood ferment which promotes this change; and carbolic acid is, we know, supposed to prevent fermentative changes. Accordingly, about six months ago, Drs Ebstein and Müller, in Breslau, proposed to employ carbolic acid to prevent this change and to cure the disease, and they have published a couple of cases[1] in which very great improvement followed the use of carbolic acid in doses of about six grains daily, and in one of them the diet was a mixed one throughout. It seems difficult to understand how, if carbolic acid prevents or checks the transformation of glycogen into sugar, it should not also check the change of sugar into lactic acid, and by preventing combustion do as much harm as good. As, however, a treatment may be good though its explanatory theory be wrong, I employed the carbolic acid in several cases, sometimes in more than double the doses recommended by these authors—I regret to say, without much benefit. In one case, the sugar, after a time, did disappear; but as the patient was dying of phthisis, and did die a few days subsequently, it may be doubted whether the disappearance of the sugar was due to the carbolic acid. The acid may be given in pills made with liquorice powder, and seems worthy of further trial.

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[1] Berliner Klinische Wochenshrift, Dec. 8, 1873.

III. *Dr A. G. Miller* exhibited AN EPITHELIAL TUMOUR, which he had removed the day before from the eye of a man, upwards of sixty. The tumour had commenced three years ago in the lower eyelid. At the date of the operation, it had extended so as to cover the eye, and prevent the possibility of ascertaining whether or not the disease had penetrated into the orbit. On removing the external portion of the tumour, along with the lower and part of the upper eyelid, the tumour was seen to extend into the cavity of the orbit. Accordingly, the eye and whole contents of the orbit were excised, as affording the only chance of completely removing the whole disease. The patient was doing well.

IV. *Dr Handyside* read a paper, entitled DIVERSE HAIR-COVERING IN THE HUMAN FAMILY, which will appear in an early number of this Journal.

V. *Dr P. H. Watson* alluded to the case of a young lady, who was covered with a hirsute downy covering or lanugo, to such an extent that she could not appear in society. Her relatives wanted something to be done for her, and sea-bathing was recommended; but soon after, when her menstruation began to be established, the extra hair-covering entirely disappeared. He also, with reference to the question of doubtful sex, related the case of a late distinguished medical man, whose appearance was remarkable from the absence of beard, and who had also a very feminine aspect and a shrill falsetto voice. He was by many supposed to be a woman. He took ill and sent for a friend to see him, and told him that he felt he was dying, and that he had left him all his fortune, which was considerable. His friend tried to cheer him up, told him that he was not dying, and said that they would not yet get the chance of finding out whether he (the patient) was a woman or not. This so infuriated him, that when he did recover, he altered his will, leaving all his money to a charitable institution.

VI. *Prof. Lister* made an oral communication on A CASE OF RODENT ULCER, AND A NEW ANTISEPTIC DRESSING SUITABLE FOR SUCH CASES. The ulcer was of large size, on the face of a man forty years of age, and presented the clinical characters of smoothness of the surface of the sore, with scantiness of discharge, and a definite but very narrow border of surrounding induration, free from inflammatory appearance, with painlessness, perfect general health of the patient, and absence of any affection of the lymphatic glands, although the disease had existed for eight years. The sore having been removed by the knife, presented on section an indurated base from $\frac{1}{10}$ to $\frac{1}{8}$ inch in thickness, of pink homogeneous aspect, and destitute of the ordinary appearances of epithelioma, but presenting in a well-marked form the "prickle cells" of Max Schultze, which indicated that, in this instance at least, the rodent ulcer was a variety of epithelioma. As in the case of epithelioma generally, the cells presented their characters in an exaggerated form; and specimens of the "prickle cells" with large nuclei and interdigitating processes locking cell to cell, were exhibited under the microscope.

The disease involving a large extent of the cheek, both eyelids, both nostrils, a considerable portion of the upper lip and part of the lower one, it was impossible to cover the raw surface by a plastic operation. It was therefore of importance that efficient antiseptic means should be employed; for there is no more simple or more striking illustration of the value of this principle of treatment, than the entire absence of inflammatory disturbance around an open wound when putrefaction is really prevented from taking place in it, the "stimulus of necessity" of John Hunter being, in truth, simply the stimulus of putrefying substances, so that the danger which usually attends open wounds is entirely avoided by efficient antiseptic measures. But the antiseptic dressing usually employed, consisting of gauze impregnated with carbolic acid, and a layer of prepared oiled silk interposed to protect the raw surface from the irritation of the acid, would have been unsuitable here, because putrefaction would have spread from the mouth and nostrils beneath the "protective," which, while it excludes the irritation of carbolic acid, prevents in equal degree the penetration of its antiseptic virtue. In cases like the present, where causes of putrefaction cannot fail to gain access to some part of the wound, the antiseptic must be applied directly to the divided tissues, while at the same time it is desirable that it should be as little irritating as possible, so as not to interfere with cicatrization. These conditions were fulfilled very satisfactorily by means of an ointment, composed as follows:—Boracic acid in fine powder one part, white wax one part, paraffin two parts, almond-oil two parts. The ingredients, after being mixed by melting the wax and paraffin, are stirred in a warm mortar till the mass thickens, and then set aside to cool, after which the firm substance is reduced in a cold mortar, in successive portions, to a uniform soft ointment. This is spread thin on fine rag, and when the almond-oil leaves it, as it soon does through capillary attraction of the porous external dressings, a smooth firm layer remains, consisting of blended wax and paraffin, together with the boracic acid, which comes off from the skin without leaving any greasy substance adhering, and does not at all confine the discharge, which, while freely shed, is perpetually supplied with a sufficient quantity of the boracic acid to ensure absence of putrefaction, while not preventing cicatrization. Such was the dressing employed in the present case, and it was beautiful to see the large raw surface, though involving such sensitive structures, yet perfectly free from surrounding redness or puffiness, while the patient, except for a short time during the day of the operation, experienced no uneasiness whatever.

(It may not be out of place to mention here, that a still better application for cases of this kind is presented by an ointment composed like that above described, except that instead of one part of boracic acid, it contains half the quantity of salicylic acid, the antiseptic virtues of which have been quite recently discovered by Professor Kolbe of Leipzig, who has also found out a method of manufacturing it cheaply.—Vide *Journal für Praktische Chemie*, 1874. Messrs Macfarlan and Co. of this city, by slightly modifying Professor Kolbe's process, are now prepared to supply the acid in a state of perfect purity at a very moderate price. Salicylic acid, while possessing very remarkable antiseptic power, is even less irritating than boracic acid.)

Dr Chiene corroborated what Mr Lister had said in praise of boracic acid. He had found it a most excellent antiseptic and deodorizer. He had used for eighteen months an ointment, consisting of one part of finely-powdered boracic acid to two parts of the unguent. simplex of the Pharmacopœia. He had also used the boracic powder mixed, in the same proportions as in the ointment, with fuller's earth, china clay or kaolin, and starch. In superficial abrasions and excoriations, in eczematous and prurigous eruptions, these powders were most efficacious. He thought his ointment preferable to Mr Lister's, in that it contained more boracic acid. The important requisite was to get the acid very finely powdered. Mr Brown, chemist, Hanover Street, had done this for Dr Chiene. He had also made the ointment since 1872, and lately he had manufactured boracic pessaries and suppositories, which Dr Chiene believed would be most useful as deodorizers in fœtid discharges from the vagina and rectum.

Dr G. W. Balfour had watched with much interest the many changes which Mr Lister had made in improving his various modes of antiseptic dressing, as cases to be benefited by such means come under the treatment of physicians as well as surgeons. He found that cases of eczema, rupia, bed-sores, etc., made rapid progress under the boracic ointment, and that, in some very obstinate cases, a perfect recovery had eventually taken place.

Dr Matthews Duncan, nearly a year ago, had been told by a patient of the very great relief she had obtained by the use of boracic-acid ointment in prurigo; since then, in many other cases, he has seen much advantage from its use.

VII. *Dr Joseph Bell* then read his paper, entitled NOTES ON RECENT SURGICAL CASES BEARING ON LEGAL MEDICINE, which appears at p. 209 of this number of the Journal.

Mr Lister was much interested in Case XI., and asked as to the amount of injury of the larynx, and the condition of the vocal cords.

Dr Stephenson was much interested in the cases of death from pneumonia, which Dr Bell ascribed to the local effect of coagula in the bronchi. He asked if surgeons recognised this as a frequent symptom, and compared it with the cases of phthisis, which, in the opinion of some physicians, are due to the effects of previous attacks of hæmoptysis, instead of, as used to be thought, that this hæmoptysis was a result of the previously-existing phthisis.

Dr Watson has noticed and described the intralobular pneumonia to occur after tracheotomy, if blood in large amount had got into the trachea, in excision of the tongue, in the operation of extirpation of fibrous polypus growing from the base of the skull, and was inclined to ascribe the fatal result, in a recent case of removal of adherent goitre, to the local effects of the blood on the ultimate bronchi, occasioning interference with respiration.

Part Fourth.

PERISCOPE.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By W. HANDSEL GRIFFITHS, Ph.D., L.R.C.P. Ed., Licentiate of the Royal College of Surgeons of Edinburgh; Librarian to the Royal College of Surgeons in Ireland; Honorary Member of the Ontario College of Pharmacy, etc.

[The author of these Reports will be glad to receive any books, pamphlets, or papers relating to Materia Medica or Therapeutics. They may be forwarded through the agencies of the *Edinburgh Medical Journal.*]

TOXICOLOGICAL AND PHYSIOLOGICAL ACTION OF EMETINE.—A. Evaristo d'Orenellas has been studying this subject. He finds that it acts as a topical irritant to the mucous membrane and to skin denuded of epidermis. It induces vomiting when injected into the cellular tissue, although not so powerfully as when it is taken into the stomach. It causes vomiting by irritating the peripheral terminations of the pneumogastric in the stomach and duodenum. In moderate doses it reduces the respiration, circulation, and animal temperature, but does not directly modify vascular tension. It is curious that under its influence the superficial cutaneous temperature is decreased, while the internal temperature is raised. It causes relaxation of the muscular system, and combats the convulsive phenomena induced by strychnia.—*B. and F. Med.-Chir. Rev.*, July; and *Revista di Medicina, Chirurgia e Terapeutica.*

ON THE EMPLOYMENT OF APOMORPHIA AS AN EMETIC.—M. Carville (*Soc. de Biologie*, 20th June) recommends the employment apomorphia as an emetic in some cases of poisoning when the poison is yet in the stomach. It produces powerful emetic effects when injected under the skin in doses of a centigramme. It is important to make the solution of apomorphia *when required for use*, for the solution very rapidly loses its activity.

HYPODERMIC INJECTION OF SULPHATE OF MAGNESIA AS A MEANS OF PRODUCING PURGATION.—*Société de Biologie*, 20th June.—M. Carville related some experiments performed by Professor Vulpian and himself, which went to prove that sulphate of magnesia, when subcutaneously injected, can produce catharsis. A discussion arose as to the mechanism of purgation, some of the members objecting to the view that purgatives act by determining an intestinal catarrh. Rabuteau believes that the theory of osmose explains the phenomena of purgation.

ON THE ACTION OF PURGATIVE MEDICINES.—This *Report* would be incomplete without an allusion to the valuable communication on the action of purgative medicines by Dr T. Lauder Brunton, in the *Practitioner*, May and June. The experimental researches of Moreau and Vulpian are alluded to in this paper, and were repeated by Dr Brunton. They prove conclusively that purgatives produce a decided secretion of fluid from the intestine, as well as accelerate the peristaltic movements. This is an important point, for the experiments of Thiry, Schiff, and Radziejewski would go to show that purgatives act only by accelerating peristaltic action, and not by increasing the flow of fluid from the intestinal wall. Purgatives are useful in many ways. They hurry the food out of the alimentary canal, and thus lessen the injurious effects of over-eating. By expelling irritating substances from the intestine, they arrest diarrhœa and remove headache, and other pains caused either by the abdominal irritation, or by the absorption of poisonous matters produced by imperfect digestion and decomposition of food. They relieve biliousness by removing bile, and are most efficient aids in the treatment of chronic poisoning by lead, mercury, and other metals. It is probable that pepsin and pancreatic ferment are absorbed from the intestine, and circulate in the blood, where the latter assists in the production of animal heat. They are then secreted anew by the stomach and pancreas, and do their work again. Purgatives lessen their quantity, as well as that of the bile; they may thus be useful in fevers, but they injure old and feeble persons, both by diminishing their calorific power and impairing their digestion. They relieve inflammation by lowering the blood-pressure, and thus diminishing congestion; and they prove beneficial in dropsies, both by abstracting water from the blood, and diminishing congestion in the kidneys.

TOXIC EFFECTS OF THALLIUM.—At the *Société de Biologie*, on the 18th April, M. Rabuteau called attention to this subject. The fact that the salts of thallium are more toxic than those of lead, affords an illustration of the law that a metal is more active as its atomic weight is higher. The salts of thallium poison after the manner of salts of mercury and copper. Thallium is a muscular poison causing the muscles to lose their irritability. M. Henocque states that the spectrum of thallium is easily recognised by its characteristic green ray.

On the Properties of Muscarine.—M. Prévost directed the notice of the *Société de Biologie*, 18th April, to some physiological properties of muscarine, the alkaloid or glucoside of *Ammanita muscaria.* It is a very violent poison. It arrests the heart in diastole, unlike digitaline, which arrests it in systole. Schmiedeberg indicated its antagonism with atropine. Muscarine increases the flow of saliva, *directly* exciting the salivary glands. It excites the lachrymal glands, also promoting the flow of tears. Atropine will check the salivation induced by muscarine.

Injection of Hydrochlorate of Quinine into the Trachea in Malignant Intermittent Fever.—M. Jousset gives two cases so treated. He passes the trocar of the syringe into the trachea about a finger's breadth below the cricoid cartilage. In one case he injected six drachms and a half of a solution of one part to ten, and in the other case, that of a child aged twelve years, he injected three drachms and a half. The injections are made drop by drop. The operation is attended with little or no pain, and would probably be indicated in cholera, hydrophobia, and tetanus, as well as in malignant intermittent fever.—*Gazette Medicale*, 4th July, and *Med. Times and Gaz.* 18th July.

Hypodermic Injection of Quinine in the treatment of Intermittent Fever, by Dr Frederick Lente, *New York Medical Journal*, March.—The following is the formula adopted by Dr Lente:—

℞ Quiniæ disulph.,	.	gr. 50
Acid. sulphuric dil.,	.	♏ 100
Aquæ fontanæ,	.	℥i.
Acid. carbolici,	.	♏ v. Solve.

The quinine and water are heated to the boiling point, in a porcelain dish, over a spirit lamp; the sulphuric acid is then added, stirring with a wooden spatula; the mixture is then filtered into a bottle, and the carbolic acid added. Dr Lente has used this solution upwards of 150 times. In one case diffuse cellular inflammation of the arm occurred, and in another anæsthesia, followed by dry gangrene of a small portion of cellular tissue. The needle should be gold, and the piston kept well oiled. The best time for administering the injection is just prior to or during the attack. From 20 minims to a drachm of the above solution may be used according to the severity of the attack. Many cases, successfully treated, are recorded by Dr Lente.

TREATMENT OF ECZEMA, LUPUS, AND CANCER, BY GURJUN-OIL.—The *Lancet*, 16th May, contains a communication from Professor Erasmus Wilson, in which that gentleman states that he has been using a liniment of equal parts of gurjun-oil and lime-water in the treatment of the above affections, with encouraging results. He states that it has the property of relieving pain.

TREATMENT OF LEPROSY WITH GURJUN-OIL.—The *Edinburgh Medical Journal* for July contains an account of Surgeon-Major J. Dougall's very successful method of treating leprosy with gurjun-oil. An ointment is made by mixing one part of the oil with three parts of lime-water, and this is *thoroughly* rubbed in twice daily. The patients also take the oil internally in the form of emulsion with lime-water.

THE GENERAL THERAPEUTICS OF THE NERVOUS SYSTEM.—The *New York Medical Record* contains a very valuable lecture on this subject by Dr E. C. Seguin. The following is the classification adopted by the author:—

A. Agents which affect the *blood-supply* of the nervous system,	1. Agents which *increase* the blood-supply.	
	2. Agents which *diminish* the blood-supply.	
B. Agents which affect the *substance* of the nervous system, ...	1. Agents which *increase* action of . . .	*a.* brain.
		b. spinal cord.
	2. Agents which *diminish* action of . . .	*a.* brain.
		b. spinal cord.

C. Restoratives and tonics.
D. Counter-irritants.
E. Electricity.
F. Hygienic means.

As means for *increasing* the blood-supply, the following are enumerated:—Decubitus or posture, compression of arteries of limbs, stimulants, agents paralyzing the vaso-motor nerves, medicines which act by increasing the activity of the nervous centres.

The beneficial effect of the horizontal position in syncope, and in all cases where anæmia of the brain is suspected, is adduced as an instance of the efficacy of *posture* in increasing the blood-supply.

Compression of the arteries of limbs, which should be done only by tourniquets, should be resorted to only in extreme cases of cerebral anæmia as a means next to transfusion.

With regard to *stimulants*, alcohol is spoken of as more efficient than preparations of ammonia. *Paralyzing the vaso-motor nerves* causes enlargement of the arteries, and is hence productive of hyperæmia in the district to which the nerves are distributed. Inhalation of nitrite of amyl in doses of from two to five drops is recommended for this purpose. If given at the commencement of an epileptic convulsion, preceding or during the aura, or at the moment of spasm of the vaso-motor nerves, the attack may be abated or diminished in severity.

As means for *diminishing* the blood-supply, the following are indicated:—Venesection, decubitus, compression of veins of the limbs, cold, stimulants of the vaso-motor nerves, and medicines which act by diminishing the activity of the nervous centres. With regard to decubitus, if the *brain* is the centre to be affected, the head should be raised, whereas in any affection of the spinal cord attended by congestion, the patient should be placed face downwards. The vaso-motor nerves may be directly stimulated by galvanism, causing contraction of the arteries supplied by these nerves. It must be remembered that primary cerebral anæmia thus produced, is followed by relaxation of the bloodvessels, and consequent hyperæmia. Among the medicines which stimulate the vaso-motor nerves, ergot and belladonna are specially indicated. Among the means which diminish the activity of the nervous centres, mental and physical rest are instanced, but mental rest is not to be considered as synonymous with inertia or idleness.

By *nervous excitants*, the author means medicines which produce an immediate stimulant effect on the nervous centres independently of any corresponding increase in vascularity. Among the *cerebral excitants* are enumerated alcohol, wines and brandies, etc., cannabis indica, belladonna, opium, ether, etc., and intellectual and emotional influences. The spinal excitants are strychnia, brucia, quinia, cantharides, and exercise (active and passive). The specific effect of cannabis indica is to excite the imagination, and hence its administration in apathetic cases of insanity. In cases of cerebro-spinal malnutrition (migraine, etc.), its influence is beneficial. Many patients can take belladonna for a long time without complaining of hallucinations or excitation of the imagination. Seguin thinks that emotional excitement is not sufficiently employed as a means for affecting the nervous centres. It is seldom applicable where organic disease is present, but is indicated where the mind is absorbed in contemplation of delusions, and in hypochondriacal and hysterical cases.

With regard to the *spinal excitants*, the indication for the use of them is the existence of simple exhaustion of the nervous centres, of spasms due to weakness and anæmia, of paralysis (inhibitory or reflex) not due to inflammation of the spinal centre. They are also useful in those morbid states grouped under the name of "spinal irritation." In these cases, strychnia should be given in doses sufficient to obtain its physiological effects, and it is best given in solution with phosphoric acid as a solvent. The author argues in favour of quinia being a nervous excitant. It cures intermittent fever, the phenomena of which are most probably of spinal origin; it aggravates spinal disease; it acts as a poison to epileptics, exciting the motor centres concerned in the production of the paroxysm. Cantharides seems to act more especially on the lower portion of the cord, and hence its utility in cases of bladder paresis, of impotency, or simple genital inertia.

As *cerebral depressants*, Seguin enumerates cold, bromides of potassium and calcium, opium, hydrate of chloral, food, chloroform, and ether, etc. In cases of cerebral irritation and insomnia from a variety of causes, the action of bromide of potassium he considers to be sure and immediate. When the use of bromide of potassium is long continued, a condition of "bromism" is set up, characterized by stupor, deficient memory, aphasiform speech, tottering gait, loss of facial expression, salivation, mucous irritation, and papular skin-disease. Hydrate of chloral is a more direct hypnotic than opium, but does not prevent the perception of pain, hence chloral should be administered in insomnia not connected with pain. Chloral should be given in cases of pure cerebral disturbance; but bromide of potassium is preferable if, in addition to the cerebral irritation, there exists some physical excitement (spinal irritation). Seguin is in the habit of adding $\frac{1}{100}$ or $\frac{1}{50}$ gr. of atropine to each hypodermic injection of morphia, for the purpose of remedying the nauseating and constipating effect of the latter drug.

As *spinal depressants*, are mentioned conium, bromide of potassium, cold, and food. Conium seems to be the direct antagonist of strychnia. It acts by paralyzing the spinal motor centres from the nucleus of the third nerve down. In small doses it produces a paretic condition of the spinal axis, and in larger doses almost complete akinesis is obtained, which may last for half an hour or an hour, but is not dangerous. As this summary of Dr Seguin's paper has already exceeded the space at our disposal, we will reserve for our next report further consideration of it.

ON A NEW TREATMENT OF CHOREA.—The *London Medical Record*, 15th July, contains an abstract of a recent paper by Dr Ransom Dexter of Chicago. Study of a case led him to conclude that all the sensorial ganglia, or the centres for the nerves of the separate senses, were more or less affected, and that the sensori-motor centres were the special seat of the disease; that the pathological condition could not be other than an asthenic condition of the sensori-motor organs; that these organs, and especially the sensori-motor guiding ones, must have *therapeutical and physiological rest*, with the additional treatment by such medicinal agents as will also contribute to that end. He treated the case by enjoining *perfect rest and quiet* in a darkened room; extract of valerian, cannabis indica, and bromide of potassium, with an occasional cathartic, were employed. Under this treatment in six days all choreic movements had ceased.

SUBCUTANEOUS INJECTION OF MERCURY IN THE TREATMENT OF SYPHILIS.—*Lancet*, 23d May.—The following is the formula preferred by Mr J. C. Cullingworth:—

Hydrarg. bicyanidi, gr. 12.
Glycerini puri, . ʒiv.
Aquæ ad . . ℥iv.

The medium dose is 10 drops. The injection should be made on the outer aspect of the upper part of the arm, or between the spine and lower angle of the shoulder-blade.

Perchloride of Mercury in the Treatment of the Diarrhœa of Typhoid Fever.—Mr T. L. Walford of Reading has published a pamphlet recording two cases so treated. The author gives drachm doses of the liquor hydrargyri perchloridi every twelve hours for a few days. Both cases were successful.

Ipecacuanha Administered as an Injection.—M. Chouppe states (*Bull. Gen. de Thérapeutique*, June) that ipecacuanha given as an anal injection is of great value in the treatment of the diarrhœa of tuberculous patients, and in the choleriform diarrhœa of young children, and that, administered thus, it does not cause disorders of the stomach. The following is the preparation he uses:—20 grammes of bruised ipecacuanha root are boiled in 500 grammes of water, divided into three parts, each part being boiled with the root for ten minutes. The three decoctions are then mixed, and boiled down to 240 grammes; this suffices for two injections. Two injections are given daily, one at about 8 A.M., the other at about 8 P.M. Vomiting did not occur in any case.

Treatment of Pneumonia and Bronchitis by Carbolic Acid.—Mr Henry Greenway writes to the *British Medical Journal*, 18th July, that he has been treating uncomplicated pneumonia and bronchitis very successfully with carbolic acid. The following is his formula for an adult:—

℞ Glycerini acidi carbolici, . ʒii.
Extracti opii liquidi, . . ♏xxx.
Aquæ camphoræ, . . ℥vi. Misce.

A tablespoonful of this is administered every four or six hours in water.

Comparative Observations on the Physiological Action of Chloral and Bromal Hydrates and Iodoform. By John G. M'Kendrick, M.D. (*Read before the Medico-Chirurigical Society of Edinburgh.*)—As this paper has already appeared in the pages of the *Edinburgh Medical Journal* for July, we shall do little more than direct the attention of our readers to this valuable contribution to therapeutics. We will, however, transcribe the author's comparison between the action of bromal hydrate and chloral hydrate:—

1. Bromal hydrate is a more active substance physiologically.

2. Chloral hydrate produces, in small doses, or soon after a large dose, marked hyperæsthesia, followed by anæsthesia. Bromal hydrate never produces hyperæsthesia, and anæsthesia only when the animal is in such a state of coma that there is no hope of its recovery.

3. Chloral hydrate does not usually produce great contraction of the pupil. Bromal hydrate always does.

4. Chloral hydrate acts chiefly on the cerebral hemispheres, and never, so far as the author knows, has been known to cause convulsions. Bromal hydrate acts less vigorously on the hemispheres, and more on the ganglia at the base of the brain and on the spinal cord, the animal frequently dying in a state of opisthotonos.

5. After death from chloral hydrate, fluid is rarely found in the shut sacs of the body. In the case of bromal hydrate, fluid is almost invariably found.

6. Chloral hydrate does not usually stimulate the salivary glands to the same extent as bromal hydrate does, but, in this instance, there are exceptional cases in which chloral hydrate causes excessive secretion of saliva in animals.

ON THE DEEP INJECTION OF CHLOROFORM FOR THE RELIEF OF TIC DOULOUREUX.—Dr Roberts Bartholow of Ohio communicates a paper on the above subject to the *Practitioner* for July. By the deep injection of chloroform is meant the insertion of the needle of the hypodermic syringe deeply into the tissues, and the injection of the chloroform into the neighbourhood of the nerve trunk, the peripheral distribution of which is the seat of pain. Considerable pain is experienced at the moment of the injection, and for some minutes afterwards, but it soon subsides, and a feeling of numbness succeeds. A puffy swelling forms at the site of injection, and an induration, which remains for some days, follows. Giddiness and sopor are soon experienced, but are never alarming. No instance of suppuration has occurred. The author relates several cases which he successfully treated by this method. Twenty minims of chloroform were injected.

PHYSIOLOGICAL PROPERTIES OF BROMIDE OF CAMPHOR.—*Société de Biologie*, 20th June.—M. Bourneville finds that this compound diminishes the number of the arterial pulsations; it diminishes also the number of the respirations, and modifies the temperature. It acts as a powerful sedative, and its calming effects may be of use in certain affections of the nervous system.

ON THE ELIMINATION OF ALCOHOL.—The *Practitioner* for July contains an interesting paper on this subject from the pen of Dr Anstie. The experiments performed by him, in conjunction with Dr Dupré, prove indisputably that the quantity of alcohol eliminated by the kidneys is practically *nil*, and that the amount given off in the sweat, breath, and fæces is fractional. The author promises a series of investigations, to be undertaken by himself and Dr Dupré, as to the physiological value of alcohol, and its influence upon the elimination of carbon from the body. The paper concludes as follows:—" 1. If alcohol be a force-producing

food, as seems by far the most likely, it is probably of great value in that capacity, on account of the rapidity with which its transformations take place. It is, however, abundantly certain that beyond a certain dosage (which is pretty clearly made out for the average, though, of course, there are individual exceptions in both directions) it becomes a narcotic poison of a very dangerous character in every respect: not the least disadvantage being, that it cannot be eliminated to any considerable extent. 2. If alcohol does not disappear by oxidation, it must undergo some as yet quite unknown transformation, after which it must escape unrecognised in the excretions. I have heard various attempts to suggest such modes of disappearance, but nothing, so far, which wears any air of probability. 3. If alcohol, however, be indeed oxidized, and yet does not beget force which can be used in the organism, this would be the strangest possible discovery. Considering the very high theoretical force-value of the 600 to 800 grains of absolute alcohol which millions of sober persons are taking every day, we may well be hopeless of any reasonable answer to the question—Why does not this large development of wholly useless force within the body produce some violent symptoms of disturbance?"

RESEARCHES ON BONE-ABSORPTION AND GIANT CELLS, by J. VON RUSTIZKY.—(*Virchow's Arch.* lix., p. 202–227.)—" The occurrence of giant cells in physiological and pathological bone-absorption (Cent. bl. 1873, pp. 326, 472, 662) is corroborated by the author, by researches on the most various bones. He could distinguish three different manners of their appearance, according as the giant cells occurred only in a single layer immediately on the surface of the affected bone, or were deposited in the superimposed soft parts, especially in diseased periosteum, or finally in the interior of bones below the roughened outer surface. In all cases where bone had disappeared giant cells could not be demonstrated, and particularly not in the fossæ produced on the inner surface of the skull, by the Paccionian granulations, and on some bones of the thorax locally wasted in consequence of hypertrophy of the heart. That continued pressure against bones may not be the chief factor in the production of giant cells, as Kölliker and Wegener maintained, follows from the last-mentioned observation, as also from the circumstance, that *e.g.* on the outer surface of callous masses, without demonstrable pressure, numerous giant cells existed. By the application of pressure on particular parts of bone in animals, artificial atrophy, with the production of giant cells, took place; but the latter existed also in the interior of the bones, where the pressure could not at least directly operate. To this it is also added, that the author, by introducing different foreign bodies into the lymph sacs of frogs—that is apparently by irritating means—could here produce giant cells; so that, besides the direct operation of pressure, he could ascribe an influence on the formation of giant cells to certain nutritive changes, which may perhaps have been called forth by pressure. At one part, giant cells exhibit very distinctly changes of form; at others, such cells especially as contain fatty particles in the protoplasm, do not; the author, accordingly, distinguishes 'stationary' from 'migratory' giant cells. On the latter he has also observed fission. As well from anatomical observations as from experiments is the conclusion justified, that giant cells develop themselves from all other possible cells. That their development in absorbing bone is not secondary, and promoted by a primary formation of Howship's lacunæ, the author has proved by experiments, concerning which further may be read in the original." —*Centralblatt. f. d. Med. Wissenschaften*, No. 26, 1874.

"UEBER CYSTEN AN DER HINTEREN BLASENWAND BEI MÄNNERN." Von Dr JOSEF ENGLISCH. (*Reprinted from the Med. Jahrbüchern* II. 1874.)—The author remarks the rarity of cysts in the small pelvis of men, as compared with the frequency of their occurrence in that of women, and gives six cases from his own experience, and a summary of thirteen cases drawn from the literature of the subject. Of the dissection of five of his own cases a careful account is given, while the sixth was simply examined, diagnosed, and lost sight of. The largest of the dissected cysts measured 2·3 ctm. by 1·2 ctm. Illustrative engravings are appended. Three of the cysts, situated in the middle line between the vasa deferentia, were pedunculated, the lower end of the peduncle being lost in the tissue between the ducti ejaculatorii; one was in connexion with the right vas deferens; and the last, not pedunculated, unconnected with the vasa deferentia, and placed somewhat to the left of the middle line. The contents of the cysts were sero-albuminous, and the wall in some cases lined with flat epithelium. The author traces the origin of these small cysts to the remains of embryonic structures. Those pedunculated and central, he derives from the Wolffian bodies, and those more laterally placed from the ducts of Müller; or the latter may be processes from the vas deferens to which they are connected, their cavities having at one time communicated with that tube; such communication having been later obliterated, possibly by inflammatory processes. Unless they are very minute, such cysts, from their position, are said to be capable of causing difficult micturition in greater or less degree. Of the thirteen collated cases, the result is only given of five; four ending fatally, and one (that of Mr Spence, *Edinburgh Medical Journal*, 1864) in recovery. In seven, the operative procedure is specified; and in two of these the result of such operation is not stated, omissions which greatly reduce the clinical value of the cases enumerated. Mr Spence's case, above referred to, and one of Mr Bryant's, are the only two out of nine said to be hydatid, which can be accepted as having been undoubtedly so, as in these alone the gross and microscopic evidence of hydatids is noted. The rest of the paper is occupied with the symptomatology, diagnosis, and treatment of cysts in this position. The tumour may fill the small pelvis, and pass a considerable distance up the abdominal cavity, and be perceptible to the examining hand above the pubis; unless very tense, it may be felt to fluctuate. The bladder is always, if possible, to be emptied as a preliminary to examination. Difficulty in passing the catheter may arise from narrowing of the urethra or alteration of its curve. The catheter, after introduction into the bladder, may be made to touch the anterior wall of the pelvis, but posteriorly it comes in contact with a rounded tumour, and cannot be felt per rectum. After puncture, the cyst collapses, and difficulty in introducing the catheter disappears. Cysts of the posterior bladder wall are to be distinguished from,—1. Solid (especially fatty) tumours; 2. Diverticula of the bladder of various size; 3. Hydrocele of the seminal vesicles; 4. A union of the vasa deferentia and their formation into one cyst (Hyrtl). The author possesses several preparations of a cystic condition of the incompletely obliterated urachus. The growth of a cyst is at first slow, but the result of inflammation, of itself or of structures in the immediate vicinity, is generally, 1. To render it more adherent; and, 2. To increase the rapidity of its growth, rendering its evacuation peremptory to relieve impeded micturition and defecation. The treatment indicated is puncture of the cyst per rectum, with or without the injection of a fluid; and where this is very difficult or impossible, as in Bryant's case, an operation resembling lateral lithotomy. Though the effect of a full bladder is to push the cyst toward the rectum, its evacuation if possible per catheter is recommended as a preliminary, after which, with the hand pressing on the lower part of the abdomen to render the cyst tense, a trocar (preferably one of large size) is pushed into the tumour. This may have to be repeatedly done. The author finally recommends one of Holt's winged catheters to be introduced through the puncture, and left in the cyst as a drain for discharge. The fatality of this operation is, in the most instances, due to inflammation of the cyst, followed by peritonitis, or the latter may precede the former event.

SPONTANEOUS FRACTURES IN PATIENTS SUFFERING FROM ATAXIA.—On this subject, so important in reference to the question of asylum restraint and attendance, M. Richet has given an interesting and clear lecture at the Hôtel Dieu. The case was that of a man aged 38, who broke his thigh in an attempt to take off his boots. It broke without pain, but with a loud crack. The symptoms of early ataxia were evident. The patient died with bedsores and general breakup on the 30th day. The post-mortem examination was made with care, and described at length. The muscles of the limb were disorganized, a large quantity of sero-purulent fluid bathed the parts. The bone at the spot of fracture was rarefied in texture and as if worm-eaten. Under the microscope the Haversian canals were found to be enormously enlarged, and to occupy large spaces filled with granular marrow. The other thigh was also examined, and was found not fragile; but the Haversian canals were also enlarged, and a quantity of fat and granulations was taking the place of bone.—*La France Médicale*, No. 27, 1874.

CIRCUMCISION.—Two treatises on circumcision are noticed in *Le Progrès Médical*, April 25, 1874.

The first, entitled *Traitement des Affections du Prepuce par l' Orlatomie*, by Dr Handvojel, introduces a new hybrid term for the operation. Orlatomy is derived from the Hebrew *orla*, signifying prepuce. Dr Handvojel uses a special instrument, a pair of fenestrated forceps, armed with teeth to fix the mucous membrane, while a triangular blade glides along the slit in the forceps. It is applied perpendicularly to the direction of the penis, and amputates the prepuce by a mechanism analogous to that of the amygdalotome.

The second treatise, entitled *De la Circoncision ; description d'un nouveau procédé opératoire*, by Aïssa Hamdy. The author is an Egyptian, and has observed in his own country many accidents resulting from the ignorance and inexperience of the barbers who perform the operation. He has seen a case of death from hæmorrhage, cases of wounding the glans, etc.

M. Aïssa Hamdy uses a pair of compressing forceps, which prevent the possibility of wounding the glans, and ensure the section of the skin and mucous membrane at the same level. The author mentions the following affections and vices of conformation, which are benefited by circumcision : phimosis congenital or acquired, adhesion to the glans, paraphimosis, balanitis. He cites a case of sterility depending on a phimosis, and ceasing after operation. He cites divers cases of affections of the genito-urinary organs, consecutive to phimosis, and cured by its removal. The most remarkable are the symptoms of vesical calculus induced by a very tight phimosis.

M. Aïssa Hamdy strongly insists on the value of circumcision from a hygienic point of view, and states that the operation is a preservative against venereal diseases, onanism, certain affections of the genito-urinary organs, and, lastly, that it favours fecundity. Apropos to the immunity of the circumcised from venereal diseases, the author quotes the opinion of Mr Hutchinson. This observer remarked, that in a part of London, much inhabited by Jews, syphilis was far rarer among them than among the other inhabitants of the same quarter.

CASE OF PREPUTIAL CALCULUS. By Surgeon J. D. NEWMAN, M.D., Residency Surgeon, Jodhpore.—The following case occurred to me in February 1873, when I was officiating as Civil Surgeon at Ajmere, and is, I believe, an unusual one:—C. R., a Hindoo cultivator, æt. 54, was admitted into the dispensary on 14th February, suffering from what appeared at first sight to be simply phimosis. On examination the preputial orifice was found completely closed by adhesion of its circumference. The prepuce was darkly congested, and felt very hard and brawny. The urine dribbled away through three very narrow fistulous openings on the under surface of the penis. The patient stated that about eighteen months previously he had had several sores (soft chancres they appear to have been), and that, on their healing, the orifice had become closed. He could not say whether the fistula had appeared before or after the closure.

On slitting up the prepuce, lying in front of the glans penis was found a large calculus, evidently phosphatic in its nature, which weighed on removal a little over three ounces. In shape it was irregularly oval, and its posterior surface was flattened and marked on either side by concavities, where the extremity of the glans had been in contact with it. Between these concavities a slight ridge marked the situation of the meatus. The sinuses through which the urine escaped were all behind the calculus, over which the prepuce was tightly stretched. I have kept the stone as a specimen, and therefore not examined its structure. It is possible that a small stone or some gravel may have passed through the urethra, and being detained by the closure of the prepuce and small size of the fistulous openings, have afforded a nucleus for the concretion afterwards deposited from the urine collected in its unusual prison-house. The complete closure of the prepuce, as in this case, must be very exceptional.—*Indian Annals of Medical Science*, 1st June 1874.

TRACHEOTOMY FOR FOREIGN BODY.—Professor Pasquale Landi of Pisa lately performed tracheotomy in a boy, æt. 7, to remove from the trachea one of the first molars, which had dropped into the trachea after extraction. The result was successful.—*Revue de Thérapeutique*, 15th July 1874.

Part Fifth.

MEDICAL NEWS.

THE Annual Meeting of the BRITISH MEDICAL ASSOCIATION was held this year at Norwich. It once before met at the same place in 1846. Above two hundred members were present.

Proceedings were opened on Tuesday 11th August, by a service in the Cathedral. In the evening, Sir Wm. Fergusson, the retiring President, delivered some valedictory remarks; and, after congratulating the members on the prosperous state of the Association, introduced Dr Copeman, the new President, who delivered interesting and thoughtful address.

On Wednesday, the first business was to consider the reco mendation of the Council that Edinburgh should be the next pla of meeting. It was resolved unanimously that the Associati should meet next year in Edinburgh, and Sir Robert Christi was appointed President Elect.

Dr Russell Reynolds then delivered an eloquent and ve suggestive address in Medicine; and in the afternoon the differe sections met for reading of papers. Sir James Paget deliver the opening address in the Surgical Section.

A soiree or conversazione, numerously attended, was held in t evening in St Andrew's Hall.

On Thursday, Mr Cadge delivered the address on Surgery in t forenoon. In it he gave very valuable information as to t frequency and etiology of calculus in Norfolk and its neighbourhoo

Professor Hughes Bennett made a statement as to the Antagonis of Medicines—hydrate of chloral and strychnia, sulphate of atrop and Calabar bean, hydrate of chloral and Calabar bean, sulphate of atropia and meconate of morphia, meconate of morphia and infusion of tea, meconate of morphia and theine, meconate of morphia and caffeine, meconate of morphia and quaraine, meconate of morphia and infusion of coffee, extract of Calabar bean and strychnia, hydrate of bromal and atropia, etc. He alluded to the large share Dr M'Kendrick had taken in the laborious investigations. The statement was received with much attention, and elicited a hearty vote of thanks.

An important discussion took place on Hospital Hygiene, and its relation to pyæmia and erysipelas, and the best means of prevention and treatment of these scourges.

The usual public dinner was held in the evening in St Andrew's Hall, presided over by Dr Copeman. About 300 guests sat down.

On Friday the address in Midwifery was delivered by Dr Matthews Duncan. It was characterized by his usual fearlessness, vigour, and accuracy of thought and language, and treated of many important subjects, chiefly puerperal mortality and puerperal pyæmia.

In the sections many papers were read and interesting discussions conducted,—among others, one on the influence of Tobacco on public health; another on the Health Districts of England and Wales, or "Stanfields muddle."

The general meeting was held in the afternoon, Dr Copeman presiding. Mr J. J. Colman, M.P., entertained the members of the Association at Carrow House.

The proceedings then terminated, though sundry excursions were arranged to places and scenes of local interest.

EXTRAORDINARY MEDICAL EVIDENCE.—*Rupture of the Vagina with Protrusion of the Intestine.*—A painful case of the above kind has been the subject of a coroner's inquest at Hartshill, near Nuneaton, Warwickshire. The poor woman in whom the rupture occurred was in labour of her eleventh child, and her labours were generally difficult. In the one previous to this, instruments had to be used by Mr Peacock, whose treatment in this case was much canvassed. We gather that the rupture occurred before the use of the instruments. The child was delivered alive. The intestines protruded, and seem to have been cut off by Mr Peacock. It is this part of Mr Peacock's conduct which excited suspicion and criticism. The case was one in which the occurrence of rupture of the vagina could occasion no great surprise to medical men. And no case is more anxious or distressing to the practitioner. At the adjourned inquest, Dr Barnes gave evidence in Mr Peacock's favour to the following effect:—

"The history of the present case was in accordance with many recorded by the great authorities. The forceps used by Mr Peacock were proper instruments to use. When there was laceration, the intestines were almost certain to protrude; no force would be required to make them protrude. He believed it was quite possible that fifteen feet might so protrude spontaneously. Where such was the case, he knew of no instance of the patient recovering. In a case of the kind there was no rule of practice to guide a surgeon. He would be thrown entirely on his own resources for the moment. The woman would almost certainly have died under the circumstances, had the intestines not been removed. He could conceive a case in which the removal would prolong life for a few minutes. He had known several instances of the kind, but it was not within the scope of ordinary practice to remove the intestines. He had known it done.—The Coroner: You cannot condemn the cutting off of the intestines?—I do not know what I should have done under similar circumstances twenty years ago.—The Coroner: After hearing the evidence, do you condemn the process of cutting them off?—Witness: I think it would be better to leave them.—In reply to further questions, the witness said he should think the cutting off of the intestines would not arise from gross ignorance, want of skill, or gross inattention."

Several other eminent medical witnesses having corroborated the evidence of Dr Barnes, the Coroner said that Dr Barnes's evidence entirely altered his view of Mr Peacock's practice. There was no evidence to show that the laceration was produced by the use of the forceps, and Mr Peacock could not be accused of gross ignorance, want of skill, or gross inattention. The jury, after a short deliberation, returned the following verdict:—"That the deceased died from the effect of an escape of intestine, consequent upon spontaneous rupture of the vagina during her confinement;" adding that, in their opinion, no blame was attachable to Mr Peacock.—*Lancet*, 11th July 1874.

LIST OF ARMY MEDICAL CANDIDATES, who have passed both the London and Netley Examinations, August 1874.

Names.	*Marks.*	*Names.*	*Marks.*
1. Ward, L. B.,	4841	9. Smith, J. A.,	3435
2. Gallwey, T. J.,	4615	10. Martin, J.,	3116
3. Miller, W. B.,	4290	11. Young, F. S.,	3105
4. Hickson, G. B.,	4265	12. Greene, J. J.,	3105
5. Jagoe, B. R.,	4085	13. M'Creery, N.,	3062
6. Prendergast, J.,	4072	14. Gormley, J. A.,	3039
7. Pratt, W. S.,	3780	15. Toss, J. E. W.,	2915
8. Smyth, C. C. H.,	3568	16. Turner, C. P.,	2887

LIST OF INDIAN MEDICAL CANDIDATES, who were successful at both the London and Netley Examinations, having passed through a course of instruction at the Army Medical School, Netley, August 1874.

Names.	*Marks.*	*Names.*	*Marks.*
1. Leckler, H. M.,*	5868	10. Malcolm Smith, G. J.,	4465
2. Corbett, J. L.,	5626	11. Lancaster, J.,	4450
3. Browne, S. H.,	5385	12. Yeld, H. P.,	4300
4. Mair, E.,	5339	13. Fullerton, J. C.,	4075
5. Benson, P. H.,	5208	14. Warden, C. J. H.,	4055
6. Armstrong, J.,	5125	15. King, W. G.,	4003
7. Warder, R.,	4825	16. Patterson, D. A.,	3980
8. Dawson, L. R.,	4798	17. Wilkins, J. S.,	3908
9. Shircore, J. C.,	4650	18. Barren, W. A.,	3602

* Gained the Herbert Prize.

LIST OF GENTLEMEN who competed successfully for Appointments as Surgeons in H.M.'s Army Medical Service at the Competitive Examination held at the London University on the 10th August 1874.

Names.	*Marks.*	*Names.*	*Marks.*
1. Harrison, C. E.,	2525	9. Fogerty, H. A.,	1615
2. Wellings, B. W.,	2250	10. Smith, R.,	1615
3. Trevor, F. W.,	1830	11. Gardner, R. H.,	1555
4. M'Gann, J.,	1785	12. Campbell, W.,	1545
5. Bourke, G. D.,	1690	13. Gardner, H. G.,	1537
6. Forrester, J. S.,	1680	14. Carter, S. H.,	1525
7. Mullane, J.,	1658	15. Powell, J.,	1480
8. Scott, H.,	1650	16. May, W. A.,	1422
		17. Hoysted, J.,	1395

OBITUARY.—Cullerier, who died on the 1st August, in his 69th year, was the representative of a name which, for nearly three-quarters of a century, has been famous in Paris and known through the medical world in the special branch of surgery cultivated by its possessors. His principal works are:—Traité des Affections Blenorrhagiques, Paris, 1861; Précis Iconographique des Maladies Vénériennes, Paris, 1866. Like his father and uncle of the same name, he was a successful teacher and practitioner, but for the last ten years of his life he has been laid aside from practice by paralysis affecting the tongue.

CORRESPONDENCE.

To the Editor of the Edinburgh Medical Journal.

SIR,—At page 153 of your number for August, your reviewer states that the "pan-and-pail method" of collecting excreta is the most satisfactory, and has long been employed in Edinburgh. As one interested in the matter, who has long believed Edinburgh to be pre-eminently a water-closet town, will you kindly ask your reviewer to state in your next number what he understands by the "pan-and-pail method."

Second, to what proportion of the population this pan-and-pail method of collecting the excreta may be held to apply. Third, in what districts of Edinburgh this method is carried out, and whether wholly or partially. Fourth, whether any differences have been observed in the spread of enteric fever in the water-closet districts, compared with the pan-and-pail districts. Fifth, whether typhus prevails specially, or is most apt to occur in either of these districts. Sixth, whether there is any connexion whatever between the interior of the houses and the drains in the pan-and-pail districts of the city.—I am, yours, etc., INQUIRER.

[The mistake our correspondent has fallen into is in forgetting that Edinburgh consists of two distinct towns—an old and a new—with very different populations. The New Town is inhabited by the better classes, and is "pre-eminently a water-closet town," whereas the Old Town consists, for the most part, of large strongly-built tenements, which, in the process of years, have undergone repeated subdivision, until individual rooms by means of partitions are found to contain several families. It has been found impracticable to supply these tenants with ordinary water-closet accommodation, and to this day they have to make use of pails for the reception of the excreta of the women and those children confined to the house. These pails are brought to the street twice daily, and emptied into carts furnished by the authorities. The authorities have also established numerous public privies on the pan system, which are daily cleaned by the public scavengers, and the contents of these pans and pails add largely to the value of the refuse of the city of Edinburgh. From a return made to the corporation this year, 41,613 houses were examined; of these 27,294 had water-closets, and 14,319 had none. The latter mainly constitute the worst part of the Old Town of Edinburgh. Some notion may be formed of the nature of the house accommodation when we state, that of the 14,319 houses, 13,505 were rented below £12. As to the presence of disease in Edinburgh, typhoid fever or diphtheria are almost unknown in the Old Town, whereas both diseases are of frequent occurrence in the New. Typhus, on the other hand, associated as it is with poverty and overcrowding, prevails in the Old, and is rarely met with in the New Town. No connexion exists between the drains and the houses of the poor.]

PUBLICATIONS RECEIVED.

William B. Atkinson, M.D.,—Hints in the Obstetric Procedure. Philadelphia, 1874.

Thos. Ballard, M.D.,—Hereditary Syphilis. London, 1874.

C. Carter Blake,—Sulphur in Iceland. London, 1874.

Braithwaite's Retrospect of Medicine, Jan. to June. London, 1874.

W. H. Van Buren, M.D., and E. L. Keyes, M.D.,—Surgical Diseases of the Genito-Urinary Organs. London, 1874.

H. Vandyke Carter, M.D.,—On Mycetoma, or the Fungus Disease of India. London, 1874.

Edward W. Collins, M.D.,—On Accessory Lobes of the Human Lungs. Dublin, 1874.

James C. Dickinson,—Tropical Debility. London, 1874.

C. Home Douglas,—Searches for Summer. Edinburgh, 1874.

Robert Farquharson, M.D.,—On the Past, Present, and Future of Therapeutics. London, 1874.

Balthazar Foster, M.D.,—Clinical Medicine. London, 1874.

Alfred B. Garrod, M.D.,—Essentials of Materia Medica and Therapeutics. London, 1874.

C. J. Manning and F. H. Elliott,—The Muscles of the Human Body. London, 1874.

William Marcet, M.D.,—An Experimental Inquiry into the Nutrition of Animal Tissues. London, 1874.

Pereira's Elements of Materia Medica and Therapeutics, edited by R. Bentley and T. Redwood. London, 1874.

Thomas Shapter, M.D.,—Diseases of the Heart. London, 1874.

St Thomas's Hospital Reports, vol. iv. London, 1873.

A. B. Steele,—Maternity Hospitals; their Mortality, and what should be done with them. London, 1874.

Sixteenth Annual Report of General Board of Lunacy for Scotland. Edinburgh, 1874.

J. Sherwood Stocker, M.D.,—Hints for Health. London, 1874.

William Squire, M.D.,—The Period of Infection in Epidemic Disease. London, 1874.

Thomson's Conspectus, edited by E. L. Birkett, M.D. London, 1874.

Francis Vacher,—Report of the Sanitary Condition of Birkenhead for 1873. Birkenhead, 1874.

Chas. West, M.D.,—Harvey and his Times. London, 1874.

PERIODICALS RECEIVED.

American Journal of Insanity,—April.

American Journal of Obstetrics,—May, Aug.

American Journal of Syphilography,—July.

American Journal of the Medical Sciences,—July.

American Practitioner,—June, July.

Annales d'Oculistique,—May, June.

Archives Générales de Médecine,—June to August.

Archives of Electrology and Neurology,—May.

Archives de Tocologie,—June to August.

Australasian Medical and Surgical Review,—March to June.

Berliner Klin. Wochenschrift,—May 25 to August 24.

Births, Deaths, and Marriages, Monthly Return of,—May to July; Quarterly Return,—March, June; Supplement for 1873.

British and Foreign Medico-Chirurgical Review,—July.

British Medical Journal,—May 30 to Aug. 22.

Bulletin Général de Thérapeutique,—May 30 to August 15.

Chicago Journal,—April.

Detroit Review of Medicine,—June to Aug.

Druggist,—May.

Dublin Journal of Medical Science,—May to August.

Echo de la Presse Médicale,—July 8.

France Médicale,—May 20 to Aug. 19.

Gazette des Hôpitaux,—May 23 to Aug. 20.

Gazette Hebdomadaire de Médecine, etc.,—May 29 to August 21.

Gazette Médicale de Paris,—May 23 to Aug. 22.

Glasgow Medical Journal,—July.

Indian Medical Gazette,—May to July.

Journal de Médecine et de Chirurgie,—June to August.

Journal de Thérapeutique,—May 25 to Aug. 10.

Journal of Anatomy and Physiology,—May.

Journal of Mental Science,—July.

Journal of the Scottish Meteorological Society,—January, April.

Literary Mart,—August.

London Medical Record,—May 27 to Aug. 19.

Lyon Médical,—May 24 to August 16.

Medical Press and Circular,—May 27 to August 19.

Medical Times and Gazette,—May 30 to Aug. 22.

Missouri Clinical Record,—July.

New York Medical Journal,—June to Aug.

Obstetrical Journal,—June to August.

Paris Medical Record,—July 1.

Philadelphia Medical and Surgical Reporter,—May 16 to Aug. 8.

Philadelphia Medical Times,—May 16 to August 1.

Practitioner,—June to August.

Progrès Médical,—May 23 to August 22.

Psychological and Medico-Legal Journal,—July.

Revue de Thérapeutique Médico-Chirurgicale,—June 1 to August 15.

Sanitary Record,—July 4 to August 22.

Vierteljahresschrift für Dermatologie und Syphilis,—1 Jahrgang, Erstes Heft.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Address to the Edinburgh Medical Graduates,* 1st August 1874. By JAMES SPENCE, F.R.S.E., F.R.C.S.E., Surgeon in Ordinary to the Queen in Scotland, Professor of Surgery in the University of Edinburgh.

GENTLEMEN GRADUATES,—It is now my pleasant duty to offer you, on the part of my colleagues and myself, our congratulations on your attainment of professional honours, and to bid you God-speed in what we trust will be a career of future usefulness. Before the relation which has hitherto existed between us is finally broken, it devolves on me, as Promotor of the Medical Faculty, to address you on such topics as are suggested by your new position as members of the medical profession. In advising you as to the course most likely to conduce to your success in life, I shall be very brief. The subject has been so frequently and so ably treated of, that there is really little new to say. I shall therefore limit myself to suggesting some practical hints for your consideration and guidance.

It is well that at the very entrance of your professional life you should clearly understand that the knowledge you have as yet attained is only rudimentary—a foundation, so to speak, on which you yourselves must labour to raise the superstructure. I would therefore seek to impress on you the necessity of increasing your knowledge of your profession, by studying it not only in its literature but in its practice. In your treatment of disease be careful to use the same exactness and accuracy in noting the history, symptoms, and progress of your cases, and to employ all the methods of investigation and diagnosis which you have been accustomed to see used in hospital. You will thus gradually acquire habits which, by advancing your knowledge and cultivating your tact and powers of observation, will be of infinite value to you in after-life. Most of those whom I address will, in the first instance at least, be engaged in general practice, and I have sometimes heard it remarked that it is difficult to keep up professional interest in the cases met with. I feel sure, however, that if you act as I have suggested, you will find that in the study of groups of ordinary cases, as they are called, great general laws will become evolved and individual peculiarities will present themselves, which will give food for thought and interest to your observations. You will gain a deeper knowledge and get broader views of disease, and greater confidence in its rational treatment.

I need not dwell on the necessity of your keeping abreast of the advance of medical science. The Medical Journalism of our day affords you great facilities for doing so if you use them aright; but it may lead you to rest satisfied with a superficial knowledge. In such publications, new views of diseased action and new methods of treatment are necessarily presented briefly and succinctly. You are expected to use due discrimination and a critical judgment in applying such information to practice. To enable you to do so properly, I would strongly urge you to devote a part of your professional reading to some of our medical and surgical classics and original monographs, instead of contenting yourselves with mere quotations from such works, that you may gain a thorough knowledge of what has been already done—a knowledge much more wanted than appreciated in these novelty-loving days.

From what I have said as to your training of yourselves to habits of accurate observation, you may assume that I do not mean you to keep the results of your observations to yourselves. It is a duty which every one owes to his profession to do what he can to add to its stores of knowledge. Do not, however, rush into print without due consideration. When you are satisfied that you have got something worth communicating, see that you have thought out your subject clearly, that you know what has been already written regarding it, and that your facts have been thoroughly tested and will bear out your deductions.

I shall offer no remarks on the spirit on which you should prosecute your profession. The academic oath which you have taken to-day indicates that in brief but comprehensive and emphatic terms. The only subject of medical ethics I would touch on is your bearing towards your professional brethren, and I do so chiefly because medical differences of opinion are much exaggerated. We are constantly taunted with the saying that "doctors differ"—a saying which I verily believe had originally no reference to medical doctors, but most probably arose in days when doctors of theology conducted their controversies before public conventions. We can easily conceive how their auditors might quiet their consciences and absolve themselves from coming to a decision by the excuse that "doctors differ." But since the stigma has by some means been fixed on our profession, you should try to live it down in your intercourse with your brethren, by all courtesy and forbearance, so far as is consistent with the interests of truth and your own self-respect. You cannot, indeed, do better than ponder well and act on the apostolic injunction—"If it be possible, in as far as lieth in you, live peaceably with all men."

I now pass from matters which concern you individually to those which interest you as members of a great and important profession. I make no apology for entering on this occasion on what may be termed medical politics—the questions of medical education and examination; for every medical man is interested in subjects which have such important bearings on the future of our profession. In 1865, in addressing the graduates of that day, whilst I expressed my sympathy with them on account of the annoyances they had been subjected to in studying during a transition period, I took occasion at the same time to point out the benefits which the Medical Act had conferred on the profession. That there remained much to be done, and many problems as to medical education and examination to be solved, was evident enough. But I trusted that all this would be effected gradually and safely under the powers which the Act conferred. My trust was, however, misplaced. Ere we had got into working order under the new system—before it had a trial—demands were made for more medical reform, as it is called, especially as to medical education and examination. Opinions were expressed, and continue to be promulgated, on these important subjects, which I think are of doubtful expediency, and which indicate but little acquaintance with the practical details of the matters to be legislated for. In regard to medical education, for example, it is easy to sketch out a general plan apparently at once concise and comprehensive; but when you come to fill in the sketch, to show in detail how, in a given period of four years, the student shall attend the different courses of instruction necessary to obtain a knowledge of medicine and surgery, the task is not an easy one to accomplish. Medical science has made such rapid advances, and its different departments have required to be so subdivided for the purpose of teaching them thoroughly, that I believe the true solution of the problem will be found in an increase of the time allotted for study, unless, as many propose, the curriculum be reduced to very small dimensions. Proposals for diminishing the number of compulsory subjects in the medical curriculum are very popular, but when tested they will be found to contain many fallacies, from want of consideration of details. As an example, I shall take one of the latest utterances on the subject—that of Professor Huxley, in his rectorial address to the students of the University of Aberdeen. I take it all the more readily that he says, truly enough, that he cannot claim any special property in this theory of what a medical curriculum should be. "If," says he, "I had the power to remodel medical education, the first two years of the medical curriculum should be devoted to nothing but most thorough study of Anatomy and Physiology, with Physiological Chemistry and Physics; the student should then pass a real practical Examination in these subjects; and having gone through that ordeal satisfactorily, he should be troubled no more with them. His whole mind should then be given, with equal intentness, to Therapeutics in its broadest sense, to Practical Medicine, and to Surgery, with instruction in Hygiene and in Medical Jurisprudence; and of these subjects only—surely there are enough of them—should he be required to show a knowledge in his final examination."

Here we have a plan of a curriculum apparently concise, and doing more than such sketches generally do, indicating the order of study; but when we examine it more closely, we shall find that it is fallacious, and meets no real difficulty.[1] Passing by for the present the first part of this programme without criticism, I would draw your attention to the fallacy contained in the second part. It arises from the ease with which one or two words can be used to express a complicated course of study—"Therapeutics in their broader sense" to practical Medicine and Surgery. Just consider what is involved in a course of study for acquiring a knowledge of these subjects. I presume Professor Huxley would scarcely exclude Pathology, or even Materia Medica; for, though in his own case he indicates a preference for a medical attendant who could not tell "gentian from ginger," most people would prefer one who knows something of the drugs he prescribed. Surgery and Clinical Surgery, Medicine and Clinical Medicine, Obstetrics, Medical Jurisprudence, and hospital attendance would certainly be requisite. If the student had all these to overtake in two years before his final examination, I really think he would be in a worse plight than at present. Do not mistake me. I think there is great need for remodelling our present system of education. I have my own views of a medical curriculum, though I will not inflict them on you now. I would only say that I think the period of study should be prolonged; and especially that it is in regard to hospital instruction, as distinguished from clinical lectures, that there is most urgent need of improvement, to ensure the student really profiting by his hospital attendance. Some arrangement should be made for distributing the hospital pupils, by allocating them by subdivision, and in rotation, to the different physicians and surgeons. They would be thus more directly under supervision, arrangements for enabling them to see the cases could be more thoroughly planned and carried out, whilst they would also have better opportunities of comparing different methods of treatment. Much also remains to be done by the tutorial system in hospital teaching. If there were competent hospital tutors selected from our graduates to instruct the pupils in small classes, and using the out-patients as well as the in-patients, physical diagnosis could be much better taught than during the hospital visit.

It is on the subject of entrance to the profession, however, that the clamour for "medical reform" is loudest, and what appears to be desired is a dead-level uniformity. To secure this by instituting one portal of entrance, we are presented with that wonderful panacea, a Conjoint Board, before which all candidates must pass their examinations; and to enable this idea to be carried out, the Universities and Medical Corporations are expected to divest themselves of their ancient rights and privileges—as a sort of penitential confession, I presume, either that they have not done their duty hitherto, or that they are not now competent for the requirements of this advanced age. This conjoint board is supported on the ground of being one compact body, in contrast to the various licensing boards. But how is it to do its work? Is the whole conjoint board to sit as a body and examine all candidates? No; that would be impracticable. One of its first functions would be to disarticulate its different joints, and detail them to examine candidates at different times and places. In other words, to divide itself into so many different examining boards. And then, where would the uniformity be except in name? Or would the great Conjoint, to give an appearance of uniformity, arrange a series of examination tests, to which examiners in each department should confine themselves, and pass or reject the candidates according as their replies were orthodox or the reverse? If so, there would be "good times coming" for grinders and pocket-compendiums.

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[1] See Note, p. 295.

Another suggestion has been made, that all graduates of Universities and licentiates of Colleges should be obliged to pass an examination in Practical Medicine and Surgery before a special Government board prior to being permitted to register or practise —something analogous to the State examinations of foreign countries. This would not only add another to the number of examining boards, but it means, moreover, State interference— a danger against which you should be jealously on your guard, whether it assume this or any other form. Hitherto our profession has been independent, because it has in a great measure managed its own affairs through its corporations. But if it barter its independence for any supposed advantage, and get under the autocratic rule of a minister of medical education, it will be an evil day for it. Those who agitate for a central government with greater powers would do well to study the fable of the frogs in their choice of a king, and reflect on the result of their selection of King Stork. The plea on which all these proposals is made, is to afford a better guarantee to the public for the efficiency of medical practitioners. Has the public felt the need of, or demanded, any such guarantee? Is the profession in this country less fitted for its duties or less respected by the community than the profession in countries where State examinations are exacted? I have had very considerable opportunities during the last thirty years of judging of the state of the medical profession in this country, from corresponding with and from meeting my professional brethren in consultation, and I utterly repudiate the grounds on which the plea is founded. I have a very high estimation for the scientific labours of our Continental brethren;

but assuredly, neither in intelligence, practical usefulness, or social position, is the medical profession in this country a whit behind that of others. The Universities and Medical Corporations have done their duty in the past, and if the visitations recently instituted by the Medical Council be properly carried out; if the visitors be not captious nor expect absolute perfection; and if the examining boards be not too ready to take offence at fair criticism, I feel satisfied the work will be better done under the existing system than by any of the new methods which have been proposed.

I leave these medical politics for a more pleasant subject—to congratulate you, its Graduates, and all connected with our University, on its present prosperity and the prospects of increased usefulness which are opening before it. I had hoped that these congratulations would have been unalloyed—but the announcement of the resignation of one who has long held a prominent place in this University, has cast a gloom over our prosperity. There is, in the present instance, this alleviation, that I am not called on to sum up the record of a life; for though failing health has led him to resign, Professor Bennett is still amongst us, and I trust he may be long spared to enjoy the needed rest to which his past labours so well entitle him. But we feel the loss of his services. Gifted with great talents; as a teacher, eloquent, enthusiastic, and energetic, and possessing the power of exciting enthusiasm in others, his great object seemed to be to instruct the students how to observe and to teach themselves. Eminent in his special department—great as a clinical teacher—his former pupils will regard him with gratitude for what he taught, and for the impulses he gave, whilst we, his colleagues, will miss him alike in the senate and in social life. His labours have added lustre to this University, and few names will more deservedly hold a place among its worthies than that of John Hughes Bennett.

Notwithstanding such losses as this—too frequent of late—and in the face of many circumstances which might have led us to look for a diminution of our Medical School rather than an increase—I need not tell you that for some years back there has been a steady increase in the number of our medical students. That this has taken place, argues well for the vital energy and recuperative powers of our University system. The very circumstances which seemed inimical have acted as stimuli, rousing its innate vitality into vigorous action, and a determination to maintain its old reputation. We have an instance of the determination to keep in advance in one of the latest acts of our University—I mean the institution of the new degree in science in the department of Public Health. It shows at once a watchful interest in meeting the requirements of the public, in affording facilities to our graduates to prepare themselves for the important offices which sanitary legislation is opening up to them, whilst it at the same time increases the teaching power and attractions of the University. The recent movement also, to provide the Medical Faculty with new buildings suited to the present system of education, shows an interest in the welfare of the University on the part of the public, which is gratifying, and is prophetic of future success. You know how much the want of proper accommodation, especially of laboratories and practical rooms, has hampered our efforts to carry out modern methods of instruction and investigation. Now, however, I am happy to inform you that, from the liberal manner in which the public has responded to our appeal for aid, the Medical School of the University will, in a few years, be accommodated in new buildings in close proximity to the new Royal Infirmary, and possess all modern appliances and means for practical instruction and scientific investigation. The same facilities for study and research which at present attract so many to foreign Schools, will then, I trust, induce many of our graduates to continue their studies in special subjects at our own University, and others, who may desire to prosecute researches in the higher departments of medical science, will be attracted to it. Thus the fame and usefulness of our University will be not only maintained but extended.

But I must close. In parting, you have our warmest wishes for success and happiness, but there is no life-path so bright that shadows never fall on it. You will have your early professional struggles; these the enthusiasm and hopefulness of youth will enable you to meet at the time, and viewed hereafter through the distance, and in the softened light of the past, you will even recall them as "the happy old times." But there may be darker trials. Much of the work of every day is done by men who go forth to it under the shadow of some great anxiety or sorrow, but who are yet enabled to do it well. There is but one source which can supply you with a motive principle—equal alike in prosperity and adversity—a motive more powerful and enduring than any that human sympathy or earthly ambition can supply; and, committing you to the care of Him who can give all needed strength, and who doth all things well, I again wish you God-speed on your life journey.

NOTE.—In regard to the first part of the curriculum recommended by Professor Huxley, I would observe that Chemistry is one of the subjects dismissed from the curriculum, and I would ask—How is a student who has not attended a course of Chemistry to understand or profit by Physiological Chemistry? Then the language used as to Anatomy and Physiology, that, having studied these subjects, and passed a thorough examination on them, the student "should be no more troubled with them," seems to indicate that he has got sufficient anatomical knowledge for practical purposes. How does this harmonize with the excellent advice given immediately before, that the student's knowledge of Anatomy and Physiology should be of that "practical, familiar, finger-end kind, which a watchmaker has of a watch"? Can such knowledge be gained by the course prescribed? I was for many years engaged in teaching Anatomy, but, as a practical surgeon, I have never found that I could cease to trouble myself about Anatomy, and I would not advise any one to rest satisfied with the anatomical knowledge acquired in two years, however assiduously he had devoted his attention to it. Students indeed are only too prone to consider themselves as "done with" subjects on which they have passed their examination. As an Examiner in Surgery, I not unfrequently find that when anatomical questions in reference to Surgery are put to candidates, I am met by the excuse that they have not been dissecting, or studying Anatomy since they passed their "second professional!" Professor Huxley diminishes the number of compulsory subjects on the plea that though a much more extended curriculum might have been reasonably enforced in the case of Methuselah, had that respected patriarch studied physic, the present narrow span of human life does not admit of more time than four years being expended on medical education. Yet, in immediate connexion with the medical curriculum, he is careful to explain that in excluding such branches of knowledge as Botany, Zoology, and Chemistry, from those compulsory on the medical student, he "is not for a moment suggesting their exclusion from the University," and proceeds to advocate the institution of a new Faculty of Science which shall include these subjects. Are we to infer from this explanation that the medical student would be expected to graduate in Science before commencing his medical studies? In that case I fail to see how the plan would really shorten the period of study, for what age must the student have attained ere he began his medical curriculum?

ARTICLE II.—*Royal Edinburgh Asylum Papers.* No. III. *Clinical Notes* (1.) *on a Case of Microcephaly;* (2.) *On a Case of General Paralysis of the Insane of unusually long Duration.* By JAMES MACLAREN, L.R.C.S.E., Assistant-Physician.

OF the various forms of idiocy, microcephaly is the rarest. Interesting in itself, it has received even more attention than it might otherwise have done, owing to some followers of Mr Darwin discovering certain characteristics supposed by them to be common to it and to their friend the anthropoid ape. Whether microcephaly be a case of atavism, "the appearance of a type of brain inherited from some very remote ancestral ape," is, of course, impossible to discuss in the short limits of a single paper; but those who are

interested in the subject, will find it entered into in Dr Ireland's paper "On Idiocy, especially in its Physical Aspects," published in this Journal for January and February 1874. An example of this form of idiocy is of sufficient rarity and interest to deserve notice, apart from the theories that may be drawn from it.

The leading authority on the subject is Charles Vogt, who published, in 1867, a monograph, "Sur les Microcéphales ou Hommes-singes." In it he gives a list of forty-two cases which he had collected. Of these, ten occurred in Germany, nine in France, ten in this country, one in Holland, six in Switzerland, two in Italy, one in Asia, two in America, and one in Africa. The following are the specimens in this country:—A cranium preserved in the Museum of the College of Surgeons, London; two skulls and brains preserved in the Museum of St Bartholomew's Hospital; the cranium of a young girl, also in the Museum of the College of Surgeons; and the brain of a boy of twelve years, presented by Mr Marshall. Among the authors who have written on or referred to the subject are Owen, "Osteology of the Chimpanzee," Transactions of the Zoological Society, vol. i. p. 343; Gore, "Notice of a Case of Microcephaly," in the Anthropological Review, vol. i. p. 169; Defert, "Report of the Notice of M. Gore," Bulletin of the Anthropological Society of Paris, vol. v. p. 15; Conolly, Dublin Quarterly Journal; Willis, "Anatomy of the Cerebrum;" Spurzheim, "Anatomy of the Brain;" Marshall, Anthropological Review, vol. i. p. 8; and Defert, "Report of the Anthropological Review of London," in Bulletin of Anthropological Society of Paris, vol. v. p. 560.

In the tenth volume of the Transactions of the Pathological Society of London, there is an account by Dr Peacock of the brain of an idiotic boy aged twelve years. The body was extremely emaciated, weighing only twenty-one pounds and a half avoirdupois. The whole encephalon weighed a little over twenty-one ounces. The hemispheres adhered firmly along the whole course of the longitudinal fissure. The convolutions were unusually small, especially on the right side and posteriorly (his left arm had been paralyzed since his fifth year, and he was liable to convulsions, affecting the right side of the face, the right arm and leg, and occasionally the left leg, but never the left arm). The cerebral hemispheres were especially small relatively to the cerebellum, and the cerebellar lobes projected considerably beyond the posterior lobes of the cerebrum. The cerebrum weighed a little over seventeen ounces, and the cerebellum, with the pons and medulla, a little over four ounces. The optic tract was wanting where it passes over the crus cerebri on each side. The spinal cord, deprived of its nerves, weighed five drachms. It measured seven inches.

Besides this account by Dr Peacock, there are several descriptions of microcephalic brains, reference to which will be found in Dr Ireland's paper already alluded to. With regard to my own case, I can only speak as to its external appearances and intellectual manifestation, for the child is still alive.

I am very sorry that one important part of the case is, owing to circumstances over which I have no control, wanting. The father is dead, and the mother leads a wandering and vagabond existence, —is, in fact, a travelling hawker. Consequently, when she was wanted she was not to be found, and her whereabouts is still a mystery. This in itself would be a matter of very small importance, were it not that she is the only person from whom a family history can be obtained. It would have been extremely interesting to have ascertained the habits of the parents, the circumstances attending the birth of this child, and its state at birth, and whether there existed any brain disease or special lesion of any kind in any member of the family. Without these facts, a history of the case must necessarily be somewhat incomplete.

J. G., æt. 17, was admitted from Craiglockhart Poorhouse into the Royal Edinburgh Asylum, on 30th May 1874. As I have said, there was no previous history obtainable, but his mother was stated to have been addicted to drink, and a bad lot generally. The certificates stated that he was a complete idiot, and utterly devoid of intelligence.

When the usual examination on admission was made, the following was found to be his condition. He was about the size of a child of five or six years, and extremely emaciated. His weight was 2 stones 4 lbs. All his large joints were permanently contracted, and those of the wrist seemed of much greater size than usual. The thighs were flexed on the abdomen, which was tumid. The arch was wanting in both feet, and the toes were larger than usual. The eyes were large, prominent, and in constant motion. This motion was very peculiar. The eyes were rolled about apparently without being attracted by any object, and then, every three or four minutes, both were turned inwards. After remaining so for a few seconds, they again began to roll, as though their muscles were subject to a constantly recurring series of convulsions. This condition has continued ever since admission. The left pupil was much larger than the right. The mouth was large, with saliva constantly dribbling from it, and the teeth well formed. Of these he had—

	M.	B.	C.	I.	I.	C.	B.	M.
Upper	2	2	1	2	2	1	2	2
Lower	2	2	1	2	2	1	2	2

The two central upper incisors were larger than the two lateral and those in the lower jaw. The upper incisors were even; the lower not so, but overlapping somewhat. He had almost no power of voluntary motion in any of his limbs, but lay curled up in whatever position he was placed. His head looked extremely small, and the forehead retreated rapidly from the supra-orbital ridges. The measurements of the head were—longitudinal, 8½ inches; transverse, 7½ inches; circumference, 15 inches. These measurements are not by any means the smallest that have been noted, but nevertheless, as will be seen, they are greatly below the normal. The head was largely developed in the basilar region, but otherwise symmetrical, and covered with short thick hair. The sexual organs were not more developed than those of a child a few years of age. The temperature was 95° in the axilla, and the pulse 72. The palate was much arched. He showed no power of articulation whatever, the only sound emitted by him being a shrill, painful, continuous crying, which ceased when food was administered. He swallowed with great difficulty, and had to be fed with liquid diet. The sense of hearing seemed dulled, but was not wanting, and it was through this that he displayed a very slight manifestation of pleasure. If a loud and constant whistling was kept up near him, it evidently arrested his attention, for he turned his looks to where the sound proceeded from, and then, after a little, stretched his lips into a kind of laugh. His sensibility to cold was great, as also was that to touch, as was evidenced by his crying when either was applied to him.

His present condition continues almost exactly the same as what is described above. His habits are entirely dirty. He has not been subject to fits since his admission. His temperature remains always about the low degree noted above. With the exception of the notice he takes of sound, he seems utterly unattracted by anything. Bright objects, animals, strangers, or his usual attendants, are all treated with perfect indifference. It is said that his mother used to take him about with her as an object to excite sympathy, and thus any opportunity of training him was lost, and he was allowed to go on from bad to worse. It is not easy or necessary to write a long description of his case; indeed, its principal characteristics are a series of negatives; nevertheless, it is interesting, and not unworthy of notice.

One thing has specially struck me in watching him, viz., that he is totally unlike any animal except a human being. He is certainly a very degraded or non-developed one, but still he is a human being and nothing else. An ape of the size and age of this creature would be strong, vigorous, cunning, and with the strongest animal passions and instincts. Self-preservation, the desire for, and the ability to obtain, food, love of the opposite sex, and many other instincts and appetites, would be markedly displayed. In this unfortunate object, however, there is none of this. If left to himself for a very short time, he would of course perish from hunger; and his appreciation of danger is evidently of the smallest, which is so far lucky, as even if he did appreciate, he could not avoid it. Fortunately, too, sexual appetite, and the power to propagate his miserable species, is altogether wanting. In fact, the one, a brute, would display its brute instincts in their full development; the other, a human being, but wanting the human intellect and the higher qualities of man, displays nothing at all except an interesting study.

My second case, to which I wish shortly to draw attention, is of an altogether different character. It is an example of a disease only too well known in asylums—general paralysis of the insane; and its interesting feature is the extraordinary duration of the malady. The average duration of the disease is about thirteen months. In the late Dr Skae's paper on the subject, he says, "I have known one or two cases of five years' duration; two above nine; and, including those cases where the paralysis had preceded the mental derangement for some time, I have known cases where the disease had extended beyond fifteen years. Dr Austin mentions one of sixteen years." Bucknill and Tuke say the "patients rarely live more than two or three years after the development of well-marked symptoms;" but they mention two cases in the Naval Hospital at Yarmouth, one of which has laboured under general paralysis for eight years, and the other for six years. "Out of 271 cases admitted into the Devon Asylum, only seven lived more than four years after admission." Dr Ernest Salomon (*Journal of Mental Science*, October 1862) says, "The course of the disease may extend from some months to three years. In rarer cases it may reach to five years, but scarcely ever exceeds that time."

Without quoting more authorities, enough has been said to show that it is very rare to find a case of general paralysis last over a very few years. The case to which I wish to draw attention was admitted into the Royal Edinburgh Asylum in May 1860, and has consequently lasted for over fourteen years. It was on admission entered as a case of general paralysis; the symptoms leading to this diagnosis, which the subsequent course of the disease has shown to be perfectly correct, being apparently inequality of the pupils, unsteadiness of gait, and indistinctness of speech. The mental characteristics were chiefly considerable melancholia, with stupor. He continued unchanged for about a year, when, for some reason which the case-book does not state, he was discharged, not improved. He was re-admitted in January 1863, having done no good since his discharge. On admission he was silent and stupid, with a heavy look, and the indications of general paralysis mentioned above. He would not walk about or employ himself in any way. In three months, however, he took to walking round the grounds and in the airing-court, and said he was quite well and happy. He articulated with the greatest difficulty, and was almost unintelligible. In other three months another change is noted, and he commenced to have the characteristic delusions of grandeur. He had the most glorious ideas of his riches, strength, might, beauty, etc.; was forty feet high, was God, was married to the Queen, was the strongest man in the world, and had "a damnable heap o' money." In other three months he was much more subdued in mind and weak in body, but happy and good-humoured. A little after this he had a series of epileptiform seizures, which were ushered in by a regular congestive attack. He became very weak, could hardly swallow, speak, or make his water, and his bowels were very constipated. Two months after this, however, having gradually rallied, he was walking about as usual, and very happy and contented. The next entry in the case-book regarding him is perhaps somewhat wanting in minute detail, but what there is of it is extremely graphic. "1864, 15th March.—No change. Is a magnificent specimen of a general paralytic." On 15th June of the same year, had a bad congestive attack, followed by epileptiform fits. He gradually got better, but was troublesome and restless. His difficulty of articulation continued very noticeable. On 15th December, is entered as gradually failing. On 20th January 1865, had another congestive attack, and on 15th March was too frail to be up. Had another bad congestive attack. In a few months he had again rallied wonderfully, and was able to walk about the airing-court, but he now manifested very destructive tendencies regarding plants and other objects. For three years after this he continued to improve; had no congestive attacks, gained flesh, and was much less demented than before. He got so quiet and manageable, and so apparently well, that he was tried in the lunatic wards of the Leith Poorhouse. He had not been long there, however, till he became violent and dangerous, and tried to strangle his attendant; so he was returned to the Asylum. On admission he was noticed to have very little affection of speech, but many grand delusions, such as having built the biggest ship in the world, being the possessor of great wealth, and altogether a person of immense importance. Very little change was observed in him for some time, and he has had no congestive attacks, but on one occasion had an epileptiform seizure.

His present condition is as follows:—He is staggering and uncertain in his walk, and very much down on the left side. The pupils are unequal, the left being larger than the right. He articulates with difficulty, and with the peculiar stuttering hesitation of the general paralytic. His tongue is tremulous when protruded. He is extremely dirty in his habits, and his capacity for indulging in oaths and obscene conversation is wonderful, even in an asylum. He is full of delusions as to his own importance, and is facile and vacuous. He is a great thief, and hoards up everything he can lay his hands on, collecting all kinds of rubbish, and storing them in his pockets and the lining of his cap and dress. He puts great value on these articles, imagining a bit of glass to be a diamond of immense value, an old brass button a piece of pure gold, and so on. He is also very fond of decorating himself with any bit of tawdry finery he can lay his hands on. Occasionally he is quarrelsome and violent, but, if left to himself, prefers to take a cheerful view of things in general.

Regarding the diagnosis of this case; with the symptoms I have described, there seems no mistaking it for anything but one of general paralysis, and it has always been easily recognised as such by the physicians who have had it under their care. In addition to the long duration of the disease, the considerable periods of remission of the symptoms were remarkable. Such intervals of apparent health, though not for so long a time, are, however, well known to those who have studied the subject. They have occasionally led sanguine or unobservant persons to believe that there is such a thing as recovery from the disease, or that a particular remedy has led to its cure.

ARTICLE III.—*Observations upon the Nature and Treatment of Difficult Occipito-posterior Positions of the Head, founded upon an Analysis of Twenty-six Operative Cases.* By ANGUS MACDONALD, M.D., F.R.C.P.E., F.R.S.E., Lecturer on Midwifery and Diseases of Women and Children.

(*Read before the Obstetrical Society of Edinburgh, 8th July.*)

IT has long been known among accoucheurs that when the head arrives near the base of the pelvis, with its long diameter so disposed that the occipital fontanelle is directed towards either sacro-iliac synchondrosis, the normal mechanism of delivery is liable to be tedious, and even to be frequently interrupted and deranged.

Associated with these interruptions and derangements, one particular mode of delivery is apt to arise, which the older accoucheurs were wont to term "face to the pubes." This, we know now, is no particular form of presentation however, but simply an arrested occipito-posterior position; but it no doubt proves itself a difficult method of termination in those cases. That nevertheless the termination of labour, even in the normal manner with rotation of the occiput forwards, under the aid of forceps, is not unattended with difficulty, and requires special care and management to prevent injuries to the lower part of the vagina in primiparæ at least, has been long impressed upon my mind. It was this fact, combined with the conviction that there exists among the ordinary authorities on the subject a somewhat unsettled opinion respecting the treatment of difficult occipito-posterior cases, that has induced me to draw the attention of the Society to this subject for a short period of time.

Believing as I do, with many Continental authorities, that the head usually enters the brim with its long diameter either exactly or approximately in the large transverse axis of the inlet of the pelvis, I am bound to hold that cases of occipito-posterior presentation do not become such till the head has advanced some little way into the pelvis, and indeed do not present under ordinary circumstances any special difficulty till the head meets the resistance of the floor of the pelvis.

In support of the statement now made, relative to the non-existence of an initial Solayres obliquity, we have to state that, in a considerable number of cases carefully examined during the early stage of labour, we have satisfied ourselves that the head passes approximately transversely at that time across the inlet.

But furthermore, the supporters of the initial Solayres obliquity have yet to prove under what force, or for what purpose, the long diameter of the fœtal head should seek to squeeze itself into the oblique of the brim, when it has the choice of accommodating itself in the transverse diameter, which is at least by half an inch the larger.

The common argument that the transverse is shortened by the encroachments of soft parts upon its extremities, has always appeared to me both weak and irrelevant. For any one who carefully examines a female pelvis, with the soft parts lining it, will, I think, feel disposed to confess, were he not previously thirled to the support of that obliquity theory, that the soft parts encroach most upon the posterior ends of the two oblique diameters.

Still the gradual approximation of the sides of the pelvis, at the extremities of the transverse diameters, as the head descends, makes it assume, long before the floor of the pelvis is reached, a position such that its antero-posterior axis coincides more or less accurately with one or other of the two oblique diameters of the pelvis, so that in difficult cases of obstructed labour, with the occiput backwards, it is seldom that the ordinary short forceps has strength and length enough to grasp the head; consequently we require, as a rule, to employ the longer curved instrument—a necessity which is, as I shall have to point out by-and-by, not unattended with considerable risk to the soft parts, provided the rotation movement of the head takes place while we are engaged in the traction efforts.

The great bulk of the cases presenting the occiput backwards terminate quite naturally without any assistance whatever. Indeed, they may be found to terminate with more than the usual celerity at the latter part of the second stage. This, however, is commonly preceded by a period of distinct retardation. I have again and again seen such a case, in which the head had been arrested in its advancement near the outlet for half an hour, an hour, or even an hour and a half, while the pains were moderately strong, terminated by a single pain the moment the head effected its normal long rotation. It is barely a month ago since I purposely allowed an occiput to the right, which assumed to some extent also the nature of an intermediate or brow presentation, to be delayed for an hour under pretty powerful pains, which were distinctly causing the parietal and frontal ridges on the left side of the head to bend;

but whenever I pulled downwards and forwards the occiput, and pushed upwards the brow, two pains of no great severity,—1st, terminated the rotation forwards of the occiput, and, 2d, the expulsion of the head. This case, as I maintain all cases capable of easy rectification to be, was a small head, and the pelvis was of fair size. No doubt, a large proportion of those labours known as "precipitate labours," if carefully classified, would be found to be cases of sudden termination of occipito-posterior positions of the head.

Between positions of the head, with the occiput towards the left and backwards, and those of the occiput towards the right and backwards, I do not think there is such a disparity as Naegele's observations would lead us to suppose. I am sorry I have not kept an accurate record of the cases I have had presenting this peculiarity; but my conviction, from the frequency I recollect of meeting it, is that it is not at all unusual. One point in respect to those cases of this position which, in my experience, have turned out difficult, is this, that they very much more frequently than the corresponding position to the right terminate as "face to the pubes."

This leads me to say that though, as noted above, the great majority of occipito-posterior positions of the head occur in labours which terminate naturally, yet the long rotation is so apt to fail, that a considerable proportion need to be aided by instrumental or other means.

These cases further divide themselves, in regard to their terminations, into,—

I. Cases which terminate by the original occipito-posterior position becoming exaggerated, the forehead and brow of the child being squeezed against the body and descending ramus of one or other of the pubic bones, and the vertex and occiput ultimately sweeping the perinæum, *i.e.*, as "face to the pubes" of the older authors. This, however, is, according to my experience, the result only in about 25 per cent. of those difficult or operative cases; or,—

II. The rotation takes place while the operator is exerting traction efforts, and that purely as a result of the mechanical conditions, at the outlet of the pelvis, depending little, *if in any degree*, upon any voluntary rotatory efforts on the part of the operator.

But if the soft parts of the mother are tight and non-elastic, this rotation is exceedingly apt to lacerate them at the outlet, as it throws the forceps into an oblique position, against the injurious consequence of which the operator has to guard.

So far as my experience goes, it seems to point to the conclusion that whether an obstructed case of this kind terminates as "face to pubes," or by rotation of the occiput forwards, if the case is finished instrumentally, depends more than anything else upon the period at which the instruments are applied. If they are applied comparatively early in the case, we have rotation at the outlet; if at a comparatively late period of the labour, we have the case terminating without rotation.

Let me now briefly analyze the records of twenty-six cases of difficult occipito-posterior cases, which I have within the last two or three years delivered by forceps, either in my private practice, my dispensary practice, or otherwise.

Of these twenty-six cases, six terminated as "face to the pubes," whilst twenty underwent the normal forward rotation of the occiput, and ended in the ordinary way by extension of the head below the symphysis pubis under the influence of traction only. I say emphatically *under the influence of traction only;* for I never exerted the slightest force in the direction of favouring the rotation movement, and indeed have often wished that it could have been delayed until I was able to have removed the forceps.

Of these twenty-six cases, eight, or nearly one-third, presented with the occiput towards the left sacro-iliac synchondrosis; and of these eight, four, or 50 per cent., terminated as "face to the pubes."

Of the eighteen cases which presented the occiput towards the right sacro-iliac synchondrosis, only two terminated as "face to the pubes."

Of the twenty-six cases, twelve, or 46 per cent., occurred in primiparæ, so that in them we had to contend with defective rotation in connexion with soft parts in a state of considerable rigidity.

Of those which terminated as face to the pubes, four of the mothers were primiparæ, and two multiparæ. In those six cases which ended as "face to the pubes," in one case only, and that, too, a multipara, did there occur anything other than the most trifling laceration of the soft parts.

In this case the laceration, which was not at all severe, affected the back wall of the vagina without involving the perineal tissues, and happened at a part where the forceps could not reach. It very soon healed up, however, and never gave the least inconvenience.

I have been most disappointed with the results in the cases wherein rotation took place. I do not mean to say that the results have been at all bad; for of these twenty-six cases, only one terminated otherwise than most favourably for the mothers; and in the fatal case, the result, I am satisfied, was not referable to the forceps operation. That the members of this Society may also satisfy themselves on this head, I will record the case at length in the course of this paper. As it is a typical case of the difficulty I complain of, they will also thereby be able better to understand the grounds of my opinion as to the trouble which one meets in the management of such cases.

I am now inclined to believe that lacerations of the lower third of the vagina in instrumental deliveries are far more common than one would expect, if he formed his opinion solely by the little reference made to them in the ordinary British text-books. But it is necessary here to notice, that by lacerations of the vagina, I do not mean those of the fourchette or perinæum, which are allowed on all hands to take place in greater or less degree in almost every first case. On the contrary, I understand interruptions to the continuity of the vaginal mucous membrane in other parts of its circumference than in the mesial line posteriorly.

At one period of my obstetrical practice, I seldom or never found any lacerations, incisions, or abrasions of the vaginal mucous membrane after operating. But now, after having my attention more strongly than pleasantly drawn to this subject by one or two of those troublesome cases, and also from finding statements corroborative of my observations in several German authors, more particularly in Schroeder, I must confess that I seldom meet with a moderately severe instrumental case in a primipara without being able to detect some little button-hole, abrasion, or even more serious injury of an incisive nature, in the vagina.

I cannot charge myself with operating with any less care, but am conscious that the very reverse is the case; and I trust also that increased experience and advancing knowledge are not diminishing my skill in the use of forceps; only, after every forceps operation of any severity, I am now in the habit of subjecting the vagina to a careful tactile scrutiny, which I did not do formerly. On this principle, I explain the difference between my present and former experience.

Luckily, however, such abrasions or button-holes seldom lead to any really injurious results. Having due regard, however, to the facility with which parturient women become the victims of all sorts of septic influences, one would like to avoid those solutions of continuity as far as possible.

But now, to take up the consideration and special treatment of those two terminations separately. I hope the Society will pardon me if, for perspicuity's sake, I briefly run over the chief points in the mechanism of a case which terminates as "face to the pubes."

Let us suppose the head in the left oblique diameter, and at or near the floor of the pelvis.

The occiput, instead of advancing downwards and forwards from the region of the left sacro-iliac synchondrosis, so as to get forwards from left to right successively into the transverse, then into the right oblique, and ultimately under the left descending ramus of the pubes, while the forehead should glide from right to left backwards over the right side of the pelvis until it ultimately reaches the hollow of the sacrum, keeps still backwards, and indeed, to a small extent, rotates in quite an opposite direction, becoming thereby nearly, but never completely, in the middle line of the sacrum. The forehead, on the other hand, rotates slightly forwards from right to left, leaving the region of the right foramen ovale, and becoming compressed against the body of the right pubic bone, and also against the upper part of its descending ramus. By this mechanism, or rather failure of mechanism, the child's head is made to engage at the outlet with its large fronto-occipital diameter in the small oblique diameter of the outlet of the pelvis, instead of presenting its lesser suboccipito-bregmatic, which is the diameter engaging at the outlet in ordinary vertex cases, when the head undergoes the normal extension, with rotation of the occiput forwards. It follows that thereby it must meet with greatly increased resistance, and so it does. The great resistance thus presented to the advance of the head in this position is such as to implant a special type to a child's head thus born.

It is accordingly found that if the labour is prolonged while the head is situated as I have already stated, it becomes remarkably shortened in the fronto-occipital direction, and elevated in the bregmatic region, giving the child's head, if examined immediately after labour, a very curious and rather odd appearance. Indeed, so great is the tension to which the fœtal head is exposed under such circumstances, that occasionally, as I have myself seen, a large cephalhæmatoma is formed in the region of the anterior fontanelle.

If we now examined such a case for the first time, we should find that the anterior fontanelle was easily reached, and immediately behind the symphysis pubis only a little more of it would be to the right than to the left of the mesial line, while the sagittal suture would run nearly antero-posteriorly, but inclining slightly to the left towards its posterior extremity, while the posterior fontanelle could be reached with very great difficulty.

If now the pains are very strong and the head not too large, the forehead remains fixed against the right pubic body and the right descending ramus of the pubis, whilst the occiput is gradually pushed down over the lower part of the sacrum, coccyx, and perinæum. In the course of this advance of the occiput, it follows that, notwithstanding the relief gained by the shortening of the occipito-frontal diameter under the influence of the pains, the great bulk of the child's head must so act as to excessively distend the perinæum, inasmuch as the forehead is incapable of advancing upwards and forwards, as the occiput does when it escapes from under the symphysis, and thus eases the tension of the forehead as it sweeps over the perinæum in ordinary vertex cases. If, however, the occiput is gradually advanced under the pressure of pains of moderate severity, and the perinæum is not found to tear, first the mass of the vertex, and then the occiput, get over the anterior edge of the perinæum; after which the forehead and face of the child, which hitherto had been tightly implanted behind the pubic bones, get loosened, and are enabled to slip downwards and forwards. The birth of the head is in this way completed by a motion of extension. The movement called restitution is, in this case, such as to make the face of the child look towards the right thigh of the mother, and to bring the right shoulder forwards under the symphysis pubis, whilst the left is made to sweep the perinæum. The accomplishment of this mechanism unaided presupposes a small head and a roomy pelvis, conditions under which, though I have seen it, it has occurred in my experience only rarely. Under such circumstances, of course, no real difficulty does or can arise, and the duty of the accoucheur is clearly to keep from all interference.

I am led by what I have observed of such cases to believe that we seldom meet with this kind of mechanism, or rather failure of mechanism, in roomy, well-formed pelves, with normally-sized heads; as under such conditions occipito-posterior cases complete the normal rotation of the head forwards, and the cases are finished without interference, and "face to the pubes" seldom or never requires to be encountered. They occur almost invariably, so far as my experience goes, in cases where the head in relation to the pelvis is disproportionately large, or where there is reason to believe that the pelvis is defective in the conjugate, or too large in the transverse diameter; so that, with rare exceptions, I have found it absolutely necessary to employ forceps before the head could be got to emerge from the oblique diameter at the floor of the bony pelvis.

For these reasons also, I have seldom seen it either practicable or advisable to use instruments with the intention either of bringing down the occiput or of favouring its rotation forwards; for it has in my hands proved either clearly impossible to effect this rectification, or, as the original conditions determining that error in mechanism were still operative, they have proved the maintenance of the rectification, even when it had been effected, impossible.

When so speaking, however, I mean to restrict myself to really difficult cases. I do not wish to assert that displacements of various kinds may not occur of such a nature as to retard labour when the head is very small or the pelvis very large, and which may at the same time be readily rectified. The case of half-brow, already recorded, is an example of the kind I mean, and the following abstract of a case is of a somewhat similar nature:—

Mrs R. (II *a.*) fell in labour at full term on Monday, 8th December 1873, the first symptom being rupture of the membranes at 6 P.M. This was followed by very slight pains for three hours, and then they increased in strength and in frequency. She was seen and examined at 10.30 P.M.; cervix found nearly dilated, and quite soft and dilatable. The head presented, but was observed to be very small and obliquely situated. The occiput was turned to the left side of the mother's pelvis, running so that the smaller fontanelle was somewhat posterior to the larger as well as on a higher level. But the child's head was strongly flexed towards the right shoulder, so that the left parietal bone presented, the right being immediately behind the symphysis pubis, and the sagittal suture passing close behind and below the pubic arch—the greater fontanelle being behind the upper third of the right descending pubic ramus. Only a small portion of the upper edge of the right parietal bone could thus be felt; though the left side of the head was pushed well down, so as to occupy the hollow of the sacrum, and present at the outlet. In this position, the head remained for nearly an hour without making any perceptible progress. I then introduced the two forefingers of the right hand, so as to seize the occiput, and pulling it downwards and backwards, and then forwards, in the interval between two pains I succeeded in almost completely undoing the right lateral obliquity, getting the right parietal to descend and the occiput forwards towards the symphysis pubis. I then held it there till a pain came on, and fixed the head on the perinæum. Other two pains completed the expulsion of the head. The child was small, imperfectly nourished, and stillborn.

What I maintain is, that in such cases the rectification is so easy that they are not worth being called difficult cases. A few extra pains would almost invariably set them right without interference.

One of my chief reasons for bringing this subject under the notice of the Society is, that I feel very strongly convinced that Professor Leishman, in his work, which I have no hesitation in saying is by far the first text-book of Midwifery in the English language, recommends, more freely than I am inclined to believe is either proper or safe, methods of treatment, which have for their object rectification of the position of the head in difficult occipito-posterior cases by means of levers, forceps, etc. I am persuaded that in almost all cases in which the conditions are such as to determine a forward position of the forehead, attempts at rectification of the position will prove abortive. Holding these views, I cannot but regard with considerable dread the dissemination among students of the idea that levers and other instrumental means may be freely used to bring downwards and forwards the occiput.

One, however, feels little inclined to discuss questions involved in such difficulty as the rotation movement of the fœtal head, were it not for the injurious practical evils which too free interference with the mechanism is calculated to bring upon the unfortunates in whom these irregularities of presentation occur. While I have never met with what might be called a really difficult case of occipito-posterior position, in which there seemed to me the slightest chance of rectification by means either of hand or lever,—and at one time of my practice I was wont to endeavour to rectify with the hand,—on the other hand, I have failed to discover any injurious results from the application of forceps, even in cases which terminated as "face to the pubes," either in my own practice or in that of others which I have seen. Moreover, I do not think there is here so much risk to the perinæum as some writers would have us to believe. No doubt the perinæum is much distended. But almost all risk in such a case from rupture may, I think, be avoided by judicious management. When such a case turns up in my practice, I never leave the head to be completely delivered with the forceps on; but, after pulling it down with instruments so far as to allow me to get command of the occiput by the finger in the rectum, I then take off the blade and allow the pains, which have usually by this time become weak, to expel the head. But if the contractions are too weak, or if the perinæum seems in specially great danger, I endea vour to get the head over the perinæum in the absence of all uterine contraction, according to Von Ritgen's manipulation.

The forceps have always in my experience been capable of effecting delivery, and only in one instance did there result a vaginal tear worthy of the name, and even this was of the mucous membrane in the back wall, not involving either rectum or perinæum. It quickly, as I have said already, healed. Very severe cases of this presentation lead, no doubt, occasionally to the necessity for craniotomy. But luckily I have as yet not met with one which could not be overcome by the use of the forceps.

Now, as to the reason why those occipito-posterior cases are so frequently defective in regard to their rotation. This is a question really very difficult to answer.

Of course the great distance over which the occiput must glide forwards and the forehead backwards, is of itself sufficient to account for some proportion of the failures; the uterine action proving unequal to complete the task, even though the occiput gets well down. But the occiput not getting well down at first, as Dr Uvedale West has pointed out, may also be to blame for some of the defective cases.

But, then, even in cases of "face to the pubes," the occiput gets ultimately so well down as to be the leading point in the completion of the labour when the mechanism fails, and yet it does not come forward.

I do not believe, with Leishman, that in those cases of rotation forwards of the occiput in posterior cases it is necessary, or is the fact, that the occiput requires to get down so far as to be placed within the antero-posterior line of the pelvis which passes horizontally through the apex of the ischial spine of the side towards which the occiput is directed. I am satisfied that many, if not all, of those cases which rotate, do so while the occipital protuberance is distinctly above the level of the corresponding spine of the ischium, and indeed that the occipital end of the cranial lever passes over the spine in its motion forwards. Of this I have again and again convinced myself by careful and prolonged observation while the mechanism of rotation forwards was taking place.

I consider that we are too much inclined to regard the fœtal head as an unyielding mass in dealing with the initial steps of this movement, and that more of the initial tendency of the head to move forwards is owing to its elastic nature and its capacity for getting moulded under the influence of the pains. The force, then, of the pains transmitted along the spinal column is expended most upon the occipital extremity of the plastic mass formed by the child's head; and as only in one direction, viz., forwards, can this mass make way, as it is surrounded by unyielding hard structures both posteriorly and laterally, it begins to bulge in the unresisted anterior direction, and thus a tendency is established which no doubt has the effect, in favourable circumstances, to a certain amount, of making the forehead rise somewhat, so as to leave more room for the parts under greatest tension to occupy. It is also to be remembered that the projection formed by the posterior parietal protuberance, in cases of occipito-posterior presentation, acts at a much greater advantage in exerting a tendency for the hind head to glide forwards than it can effect in cases in which the occiput is towards a foramen ovale. At any rate, I have watched for hours occipito-posterior cases before they rotated, and have observed that the moulding process invariably preceded the marked, and often instantaneous, rotation of the head forwards.

I am inclined to believe that, though relative narrowing of the transverse diameter of the pelvis is no doubt a chief cause of those difficult occipito-posterior positions, general large size of the head is a most important factor; and that in consequence of this large size of the head the forehead gets so wedged into the pelvis anteriorly that its tendency to slacken and rotate backwards does not come into play. So soon as it fairly refuses to move backwards as it ought to do, the self-same plastic condition of the child's head, acting through the bregma, which is now the part exposed to least resistance, wedges it more and more into the unsupported space, and thus very quickly renders rotation of the forehead backwards, and consequently also rotation of the occiput forwards, impossible; so that the same plastic condition of the head which affords the best explanation of the causation of the proper rotation forwards, likewise explains best the failure of that rotation when the head is large.

That, however, pelvic specialty of conformation has much to do with these irregular positions, the frequency with which they recur in the same woman very pointedly attests.

In one of my patients, I find her labours, which have been three, to be made up of two occipito-posterior and one face case; all were, however, comparatively easy. In another, there occurred three occipito-posterior and a brow. In a third patient, who has been confined four times, the presentations have run three occipito-posterior and a face.

I might, indeed, multiply such examples from my notes of cases, but those recorded are sufficient to prove that occipito-posterior positions are apt to repeat themselves in the same individual.

A few words now in closing, respecting the treatment of those difficult occipito-posterior cases, in which, from original uterine inertia, from exhaustion of the uterus from severity of pains, or from other causes, the forceps were needed to effect delivery; but in which, when the head had arrived at the outlet of the bony pelvis, the occiput rotated forwards.

Such cases are not to be confounded with cases of obstructed labour, in which the head is seized by forceps high up in the pelvis before it left the transverse diameter. They were all carefully diagnosed as cases of occiput to either sacro-iliac synchondrosis before instruments were applied. It does not, however, matter much although any of them had been cases of original transverse position of the head; because even then the same difficulty from the rotation of the occiput forwards at the outlet, when in the grasp of the curved forceps, would be experienced; only in that case to a less degree, inasmuch as the angular divergence between the conjugate and either end of the transverse diameter is less than the angular distance between the anterior extremity of the conjugate and the posterior extremity of either of the oblique diameters, measured along the brim of the pelvis. In these cases we usually experience difficulty before the head is well down towards the floor of the pelvis; and I believe, not so much on account of the position, as on account of the general large size of the head, combined with the arrest of proper pains in a uterus that has been worn out in a difficult first stage. I repeat, the obstruction can rarely be completely explained by the position; because before this obstruction, due to defective rotation, can come into play, the vertex must have descended to the level of the lower edge of the body of the third piece of the sacrum, which I am satisfied it had not done in all my cases. Still, the backward direction of the posterior fontanelle has, no doubt, something to do in rendering these cases more troublesome than they would otherwise have proved. In two or three of those cases the heads were so large that the concavity of Simpson's long forceps was found incapable of embracing the whole of the head, and the instrument was found to enclose only a portion of it. From this there results a very marked tendency in the instrument to slip, which, in the first case of the kind I saw, very much puzzled me.

In all of those twenty cases, rotation took place wholly or partially at the outlet of the bony pelvis, and purely as a result of traction efforts. In no case did I find the slightest inconvenience when dealing with multiparæ, nor could I detect in these the least trace of injury to the soft parts. On the other hand, in operating on primiparæ, I have been frequently galled to find abrasions and other interruptions of continuity in the vaginal mucous membrane at its lower part. These vexed me much, and led, on more than one occasion, to unnecessarily severe self-recrimination. The main cause of these abrasions, which at times amount to lacerations, and which, although they may be greatly diminished by care, and especially by operating slowly, are very difficult to avoid occasionally, is the rotation movement of the head at the outlet when in the grasp of the forceps, the soft parts at the same time being very tight. The result is this:

Suppose we have to deal with a case in which the occiput originally presented to the left and posteriorly; when the head is engaged in the outlet of the bony pelvis, it will be found to rotate under the influence of traction efforts alone; and as it does so, it throws the blades of the forceps, which were originally applied solely with reference to the pelvic cavity, and in such a manner that the line joining the central point of each fenestra would pass nearly transversely across the pelvis, into an oblique position. The left blade is now pushed upwards with considerable force towards the upper extremity and left side of the external genital fissure, whilst the right blade is turned downwards and made to project its sharp free border against the perinæum.

Suppose now the pains are severe, or the traction efforts continued, we are very apt to have the vagina injured in both the situations referred to—viz., in the region of the left labium minus anteriorly on the left side, and posteriorly on the right, more or less to the right of the central line of the perinæum.

Besides these risks it is exceedingly important to notice that the blade, which is in relation to the occipital extremity of the fœtal head, is usually found to have been applied so as to receive the occipital tuberosity between the limbs of its fenestra. This part projects considerably between the limbs of the fenestra, and it requires some care to free the occiput from between the limbs before the blade of the forceps can be removed. If now, in our anxiety to avoid rupture from the awkwardly oblique position into which the blades have got, we attempt to withdraw the left blade too rashly, we are very apt to aggravate very much, if not occasion, the very tear on the left side, which we desire to prevent.

Such being the case, it has become my practice to remove the blades of the forceps so soon as the head is all but cleared of the bony pelvis, and *preventing recession* of the head by the assistance of passive pressure upon the forehead by the forefinger of the right hand in the anus, aided by gentle pressure on the abdomen by means of the left hand, to wait till the pains are able to complete the delivery, if that is at all possible,—guardedly aiding the effect of such pains by Von Ritgen's manipulation. The head, which as yet has only partially rotated as a general rule, now gradually and slowly completes the rotation so as to bring the sagittal suture nearly to coincide with the antero-posterior mesial plane of the body, and at the same time the soft parts are slowly and safely dilated; but if the resistance of the perinæum is too great, or the uterine action completely in abeyance, the practitioner is obliged to reintroduce the forceps, and thereby effect delivery.

I have often thought that if one had always at hand a pair of straight forceps on these occasions, it would be advantageous to remove the curved blades when the head had been pulled well down into the outlet of the bony pelvis, and then, fixing it there by regulated pressure upon the abdomen, to apply straight instruments, and complete the delivery by their means. I have never been fortunate enough to have both sets of instruments with me at a case of this kind; but on the first opportunity that occurs to me, within easy reach of a short pair, I mean to try the effect. The short forceps could of course be allowed to rotate in any direction at will, without the slightest fear of bad results.

These cases, to my mind, form a considerable objection to the general rule—which, on the whole, is a good one—that one should accustom himself to the use of the long curved instruments only.

Another remark and I have done, and it is this, that I do not think that one is ever at liberty to undertake the instrumental charge of such a case without the aid of a skilled assistant to take charge of the chloroform at least. I have on more than one occasion experienced considerable discomfort and anxiety from having no other assistance than that afforded by a flurried and half-educated nurse.

As an example of some of the difficulties I mean, I give *in extenso*, as I formerly promised, the only fatal case I have met in this connexion, so that gentlemen may see by example what kind of cases I have been speaking of.

Mrs M. M'G., æt. 23 (I *a*.), confined on 21st November 1873. Patient took ill on 17th November, but did not send for her medical attendant—a student attached to the New Town Dispensary—till the evening of the 19th. He remained with her during the night, and as she complained much of pain, he gave her first 30 gr. of chloral hydrate, and subsequently 23 minims of laudanum. On the morning of 20th, on examination by my then assistant, Dr J. B. Smith, the head was stated to be well down into the pelvis, and the cervix dilated to about the size of a crown-piece, but rigid, apparently owing to too frequent examinations (30 to 50 times) during the previous night. Pulse 78; pain and suffering not great. There had, however, been some vomiting. The membranes were stated to have been ruptured two hours previously. In the evening the cervix slightly more dilated, but grasping the presenting head very tightly, and a caput succedaneum forming. Pains weak and irregular, pulse good, and patient in better condition than in the morning. Breathing, however, rather quick, and evidence of extensive consolidation of the right lung at the apex. During this night the patient continued much in the same condition, getting from her attendant another dose of chloral, which procured her a little refreshing sleep. At 10.30 A.M. on 21st, I saw her for the first time. State then was, pulse regular, good strength, about 80, tongue clean, temperature normal, patient vomiting almost everything she took, uterus hard, and also tender to the touch. The bladder was largely distended, and there was a complete absence of pains. On examination per vaginam, head found well down, but cervix only about one-half dilated. A large caput succedaneum. Occiput to the left and posteriorly. A notch, about one-half inch in depth, in the left side of the cervix. Child's heart heard over the right lower aspect of the uterus; regular, but somewhat feeble.

The bladder was emptied, and the patient left till one P.M., in the hope that the pains might recur. At this hour, there being no recurrence of the pains, the long forceps were introduced; but on their introduction it was observed that the cervix was peculiarly lacerable and fragile, giving way like wash-leather under the

pressure of the finger. With considerable difficulty, the head, which was a remarkably large one, was brought through the outlet of the bony pelvis, undergoing at the same time the long rotation of the occiput from behind forwards and to the right, whereby the forceps were thrown into an oblique position, giving rise to partial laceration on the left side of the vagina and abrasion of the right. The left blade had become fixed over the occipital tuberosity, and the right over the forehead. Fearing further tear, the forceps were removed, in expectation that the contractions would now complete delivery. But notwithstanding every legitimate effort to induce uterine action, the inertia remained profound. The forceps had to be reapplied, and delivery completed artificially, which was effected about 2.30 P.M. The uterus contracted fairly after expulsion of the placenta, and there was no post-partum hæmorrhage. The child, which was a male, was dead.

In the evening, the patient was feverish, and felt much exhausted, the tongue coated and dry, pulse 120, respirations 50 per minute. No unusual tenderness over the abdomen. She had two Dover's pills, of five grains each, but during the night slept little, and next morning was still more exhausted. Pulse still 120, but exceedingly weak,—in fact almost imperceptible. Respiration 50; abdomen tympanitic, and great tenderness on pressure over the uterus. Patient ordered beef-tea and stimulants every half hour, a pill containing 2 grains of calomel and ½ grain of opium every five hours, and hot fomentations, with turpentine stupes over the abdomen. At 1 P.M., she was much the same, but her nurse had been so very remiss as to give her brandy only once. At 6 P.M., pulse stronger, but otherwise she continued the same; at 10 P.M., she was evidently sinking; and at 11 P.M. on 22d, she died.

A post-mortem examination was refused.

As already stated, I do not think the operation is chargeable with the fatal issue in this case. The painful termination of the case was no doubt due to acute metritis supervening upon a specially tedious labour, occurring in a patient enfeebled by the coexistence of pulmonary phthisis. Ever after I first saw the patient, I was concerned lest we should have a cervical tear passing up into the lower portion of the body of the uterus. This opinion was grounded on the fragile condition in which the cervix was found. But I had no reason subsequently to the operation to believe that such a rupture had taken place.

It is deeply to be regretted that the *nimia diligentia chirurgiæ* on the part of the student in attendance, should have been so perversely directed. It is only a poor apology that the errors were committed under the influence of the best of motives. I think it had been better had both chloral and opium been withheld; and certainly the frequent examinations during the first stage were alike injurious and unwarrantable.

The nature of the injuries inflicted by the forceps upon the lacerable and irritable, but resistent soft parts, is typical of the class of cases I have just been discussing.

A question might also be raised here, which is, to my mind, one of the most important and difficult in practical midwifery, and it is this: When, in a case of rigid os, such as the above, is the proper time to interfere? It would come up in this connexion as an answer to the query, Was, or was not, the use of instruments too long delayed? I have repeatedly, in the management of cases with rigid cervix, put to the test both the practice of delivering early, and that of delaying as long as possible with safety to the mother and child, and I must say that the more of such cases I see, the more the conviction is forced upon me, that it is safer by far to operate somewhat late than too early. Seeing that, at 10.30 on the 21st, the child's heart was heard to be beating quite distinctly, and the pulse not over 80, it seems to me that no undue delay was made in putting off the operation for two or three hours, in the hope that the pains might return. But such question does not admit of a definite solution applicable to all cases of the kind in the general, as each patient's surroundings and conditions form a law of themselves applicable only to the particular case in hand.

But I must conclude by formulating the chief practical points I have endeavoured to maintain in this paper, and these are as follow:—

1. In occipito-posterior positions, if these are persistent, we may safely assume that we have some pelvic peculiarity or disproportionately large head to deal with, and, as a general rule, all attempts at artificial rectification of the position of the head will prove abortive, and are even dangerous if attempted to be effected by means of levers, forceps, etc.

2. The only exception is when temporary delay is occasioned from accidental displacement of a small head; in which case one has the alternative of waiting till the normal powers of parturition effect delivery, or of facilitating that event by timely rectification of the head by the hand.

3. In cases which threaten to end as "face to pubes," and are at the same time decidedly difficult, it is best to pull the head through cautiously, and to abstain from every attempt at rectification of the head—special care being taken to guard the perinæum, as the occiput, when passing over it, greatly distends it.

4. In cases of obstructed occipito-posterior positions in which the rotation takes place at the outlet of the bony pelvis, while the head is in the grasp of the curved forceps, there is very great danger, in the case of primiparæ, of the forceps lacerating the soft parts, on account of the oblique position into which they are thrown.

5. To prevent this accident, either, 1st, the blades ought to be autiously removed, the head fixed in position, and the uterus llowed to finish the expulsion of the head; or, 2d, the curved istruments may be reapplied adjusted to the altered relation of arts; or, 3d, a straight short pair may be applied, and the further dvance of the head thereby secured.

ARTICLE IV.—*Case of Mechanical Obstruction to the Flow of Urine for Eleven Days.* By DR BLAIR CUNYNGHAME.

(*Read before the Medico-Chirurgical Society of Edinburgh, 1st July.*)

THE following case of mechanical obstruction to the flow of urine seeming worthy of being recorded, is my apology for presenting the notes of it to this Society.

The subject of it is a man, J. T., æt. 51, residing in St Andrew Square, by occupation a baker, which he has followed all his life —and his wife being the keeper of several offices, their circumstances appear to be comfortable, and residence good.

He applied as an out-patient at the New Town Dispensary on Monday, 18th May 1874, complaining of inability to make water, and pain in left lumbar region.

He is a slightly-built man, and appears to be older than his years indicate. Has always been very temperate.

He states that, on the night of Saturday the 16th, he was detained very late at his work, but went home feeling quite well, "and in his usual." He slept well, and urinated freely on Sunday morning on rising.

While eating his breakfast (on the Sunday) he was suddenly seized with severe pain in the left lumbar region, which caused him to cry out.

After the pain came on he passed no urine. His wife applied —on the Sunday and during the night of that day—hot turpentine epithems and poultices, affording some relief to the pain.

Such was his history when he presented himself at the New Town Dispensary, the pain then not being quite so severe.

On examination, the bladder was found to be empty. There was a good deal of tenderness over the left lumbar region, and when pressure was made over left iliac and inguinal regions. Tongue and pulse good. Ordered a diuretic, with hot baths and stupes over the painful parts. He continued in the same state until Wednesday the 20th, when he passed a *small* quantity of urine (about a wineglassful, his wife states), *i.e.*, four days without passing any.

He passed none on the 21st and 22d, and on Saturday the 23d the pain became so very severe that he rolled upon the floor in agony, and sent for one of my pupils, Mr Lunan, to visit him (this the 7th day).

Mr Lunan found him suffering great pain in the same parts as formerly, and still no signs of urine. He passed a catheter into the bladder and found it empty.

Some medicine was ordered, and the fomentations were continued.

The patient remained in an unchanged condition during the Saturday and Sunday—23d and 24th—when Mr Lunan asked me to see him again on Monday the 25th (the 9th day).

I found him in bed, with a look of great suffering; no urine had been passed; quite calm, but somewhat restless; no muscular twitchings or convulsive movements; no headache or drowsiness; tongue quite dry; pulse normal; thirst great; appetite *nil;* occasional vomiting; no diarrhœa; no sweating. The pain is still unchanged, and the tenderness great. There is some ascites. No œdema of feet. Other organs healthy.

Ordered the diuretic to be continued, and beef-tea, wine, etc., to be given when able to be taken—on account of the sickness—and ice. Fomentations to be continued. Tr. hyoscyamus to be given alone, as a sedative.

On Thursday the 26th (the 10th day of suppression, the small quantity passed on the 4th day excepted), I found him much depressed, lying on his back, unable to move. Tongue perfectly dry and brown; some sordes on teeth; pulse somewhat rapid; mind quite clear; thirst great; sickness not quite so bad. No sleep at night; no wandering.

Ascites increased. Not a drop of urine. No swelling nor tumour to be discovered in loins. Continue treatment. *Prognosis very bad.*

Wednesday 27th (11th day). No further report. Patient still lower. Mind quite clear, no delirium, no sweating. Continue treatment, and told his wife to employ gentle friction, and kneading occasionally over the left lumbar and lateral regions.

Thursday 28th.—On visiting him in the morning, we found, to our great delight, that during the night he had suddenly passed a quantity of urine, with, his wife states, a small clot or two of blood in it; otherwise it appeared quite normal. No calculus was to be seen. He is in much the same state, but passing water freely, and no sickness. Stop the medicine, and give plenty of beef-tea, wine, stimulants, etc. The urine quite normal. Not a trace of albumen in it. We did not get the specific gravity.

He now began to rally, and gradually recovered under the use of tonics and regimen; being now (12th June) able to go out for a walk, but not to work. No calculus has been passed up to this time.

As to the diagnosis of the case:—About eight years ago he suffered from gravel, but it did not last long, *i.e.*, he noticed the minute concretions in his urine for but a short time.

He has been subject to pains, which he thinks, and probably correctly so, to be rheumatic, as he has frequently been obliged to work in damp, cold bakehouses. Eighteen months ago, he had a sharp attack of pains all through his body, which kept him an invalid for two weeks.

His condition during his illness was probably as follows:—The kidney horse-shoe with one ureter, not impossible, and therefore to be kept in mind; or the right kidney to be either absent, or, *most probably*, having undergone some pathological change which quite prevents its physiological action, viz., secretion of urine. There was never during his illness any pain or tenderness on the right side.

The ureter of the left kidney, we suppose, was occluded by a calculus (probably uric acid) caught in its passage from the kidney to the bladder, either at the renal or vesical end, probably the former, as the pain commenced in the loins; and again, no stone has been passed, although it may be lodging in the bladder.

The pain was of that kind found in so-called renal-colic, and the small clots of blood passed with the first flow of urine would come from laceration of the mucous membrane, occasioned by the displacement of the calculus.

In the treatment, the use of opium was avoided, as it appears not unfrequently to interfere with secretion. Hyoscyamus was freely used instead.

Diuretics were employed to endeavour to wash out the obstruction by obtaining a flow of urine, by which the tube might be dilated behind the obstacle, and as it were float it out. Friction and kneading appeared to be of use, as it was after the free application of such the urine flowed freely.

The more interesting points of the case appear to be:—

1. The length of time passed without urination, excepting the small quantity on the fourth day.

2. The total absence of symptoms of uræmia occurring during that time.

3. The advantage, or apparent advantage, of the mechanical action of gentle friction.

ARTICLE V.—*Note of a Case of Temporary Loss of Voluntary Power, produced by a Touch on the Head.* By JAMES DUNSMURE, junior, M.D., F.R.C.S.E., Physician to the Royal Hospital for Sick Children, Edinburgh.

(*Read before the Medico-Chirurgical Society of Edinburgh, 1st July.*)

A. B., age five years, was brought to the Children's Hospital on the 16th January 1874, suffering from a temporary loss of voluntary power, produced by anything that touches his head without his being conscious of it going to be touched.

The patient's mother gave the following history on his admission:—He enjoyed perfect health, with the exception of an attack of measles, followed by pneumonia, until he reached the age of two years and a half, when one day, on patting him upon the head, she noticed him fall forward into her arms. Ever since that time, on his head being touched, without his before being made aware of it, he has fallen to the ground. He walked when two years and three months old. Dentition was easy. At first, the attacks were slight and frequent, but diminished in number on his being kept in bed.

Lately, they have increased in frequency and severity, and last about five minutes, when perfect recovery takes place. He is never insensible during one, but appears perfectly conscious of everything that is going on around him. Three months ago, he was noticed to lose the power of his right arm and leg during an attack. If he has anything in his hand at the time, it is immediately dropped. When he is made aware that his head is to be touched, no attack takes place. On his getting a knock on the back, or any other part of the body except the head, he does not fall, but starts a good deal. From infancy he has started and screamed much during his sleep. He has no fear of being left alone in a dark room. He never had convulsions during teething, and never had a fright. He is unable to speak, with the exception of saying a few words, and is very much frightened at animals, as a dog or cat, but is not in the least shy with strangers, making friends with them at once. He has never suffered from worms, and his bowels are regular. Unless he is kept warm round the lower part of his body, he is subject to incontinence of urine. His gait has always been noticed to be unsteady. Lately, on awakening from sleep, he cries, and is more irritable than he used to be.

Family History.—He has two brothers and two sisters, all of whom are healthy, with the exception of one sister, who suffers from curvature of the spine. There is no history of epilepsy on the father's or the mother's side. The father is of a very nervous temperament.

Present Condition.—The boy has the appearance of perfect health, and is well nourished. The head is well formed. The eyes are bright; there is no squinting, though he has a habit of looking sometimes from under his eyebrows, which gives him a look as if he squinted. He does not speak, but only says a few words with o in them, as "horse," which he pronounces "oss," "open" "ope," although he understands every word that is said to him. He hums several Scotch airs very correctly, and is very fond of music. He sleeps well, but starts much in the night; when he awakens, his face is always much flushed, and he cries for a little time afterwards. After an attack, on asking him if he has any pain, he points to his head, but is not able to indicate any particular affected spot. On touching any part of his head sharply when he is unaware of it, he immediately falls to the ground, perfectly powerless, though quite sensible, and remains lying for a minute or more till he is able to rise again. The first time I saw him, the muscles of the right arm and leg were slightly tonicly convulsed; but that is the only time I ever noticed any approach to a convulsion. His mother told me that once or twice, when he had had a very severe fall on a day when he was particularly sensitive to attacks, she noticed slight tremor of the right arm or leg, or of both legs alone. During an attack he occasionally cries; the eyes are either half-shut or open, the pupils are unaffected; the face is generally flushed, but it sometimes becomes very pale a short time afterwards, and the arms fall to the side. The sphincters are never relaxed. On days when he has had a number of attacks, the hands are very unsteady, and shake a good deal. He has a tendency to fall to the left side; sometimes the right arm and leg are quite powerless, and remain so for a minute or more, and then recover, while he generally raises the affected arm up with his left hand. Within the last three months he has used the left hand more than the right for doing anything, as feeding himself, etc., etc.

It is not necessary for a second party to touch the head to induce an attack, for he frequently causes himself to fall while playing with a piece of paper or a ball, if it happens to come in contact with any part of the head; or even when touched suddenly with his own hands, or in feeding himself, if the spoon comes against his face. Combing his hair is a frequent cause of an attack. On being made aware his head is to be touched, he is able to withstand the attack, even if a severe knock is given. He is generally in the greatest spirits, playing and romping about with other children; but some days he is irritable and dull, and on those days he is particularly subject to attacks. On the posterior part of the head there are generally one or two swellings, due to the falls he receives. Tapping him over the spine, especially in the dorsal region, causes him to start, and the right arm is jerked slightly away from the body. While eating anything hard he sometimes falls; for example, if given a lozenge or a bit of sugar, he bites it very cautiously, evidently afraid of it breaking, which, if it does suddenly, he either starts or falls down.

Galvanism applied to the head produces no attack, nor does the sudden application of heat or cold. Any sudden noise has no effect. When his head is touched during sleep, his whole body starts violently, and in about a minute or less his face becomes paler, which appears to me to be very much the same phenomenon as is produced when he is awake, only he is in the recumbent position, and is not able to fall. He drags his right leg very slightly on walking, and on going up stairs he always puts the left one up first. The digestive system is in good order; tongue moist and clean; urine normal; heart and lungs quite healthy; pulse 100; temperature 98·4°. Dr Argyll Robertson kindly examined the eyes for me with the ophthalmoscope, and found them quite healthy. During the last six months he has improved very much, the attacks are neither so numerous nor so long. At present they rarely last above a minute.

Treatment.—When he was brought to the Hospital he was put upon five grains of bromide of potassium three times daily, which he continued for three weeks; but as he made no signs of improvement, and the attacks got worse, it was changed to Easton's syrup, which he took for some weeks. At first he got rather better, and his general health improved; but as the attacks were still continuing severe, I determined to try a course of arsenic, which he commenced about the beginning of March, and continued to the middle of May; during which time the attacks were not so frequent. Since then he has been having belladonna, which seems to suit him better than anything he has tried, so much so that for a whole week he had only one attack; and I thought he was going to get better, but since then he has had attacks, though not so numerous and severe. I was induced to try belladonna, from having read in the *Lancet* of its good effects in a case narrated by Dr Ogle, which resembled this one, 1st, in the apparent consciousness during the attack; and, 2d, in it that it could be produced by a touch, viz., on the left arm.

Dr Ogle's differed from mine in there always being true convulsions, and the inability on the patient's part to resist the attack. I have been anxious to bring this case before the Society to-night owing to its peculiarities; so far as I know, no case presenting all these characters together having been observed before. A good many cases have been reported, where, from stimulating some part of the body distant from the heart, a regular epileptic fit has been brought on preceded by an aura; but this one differs from most of them by the almost invariable absence of any convulsive movement, together with the seeming consciousness during an attack, and of the power of warding it off under certain circumstances. It is extremely difficult to know whether there is at the time of fall a momentary loss of consciousness or not. If attacks have been induced when he is sitting, I have noticed his head fall forward for a second, and then immediately recover itself, during which time he may have been unconscious, or the falling forward of his head may have been entirely due to the loss of voluntary power.

If I may venture to give an opinion as to the nature of this curious affection, I am rather inclined to put it under that class of disease called epileptiform, but hope to have the views of members of this Society more experienced in obscure diseases of the nervous system than myself.

ARTICLE VI.—*Epidemic of Dengue in the Island of Mauritius, in 1873.* By Dr LABONTÉ. Translated by Dr BRAKENRIDGE.

THIS fever, previously unknown in Mauritius, made its appearance in the country in February, and continued as an epidemic for almost four months. Few of the inhabitants of the town escaped it. Long before it was imported into our midst we were familiar with it through notices of it in the journals of India, where apparently it ran a much more severe course than with us. Be that as it may, like all the contagious and epidemic diseases of the great peninsula, the dengue was conveyed directly to us by an emigrant ship.

The first cases which came under our observation presented some diagnostic difficulties. Accustomed to see the fever of 1866, the type of which has since undergone a complete change, and having followed it through its various phases—one of the last forms of which, and a very common one, consisted of attacks accompanied by an eruption on the skin resembling nettle-rash—the first cases of dengue escaped recognition, and would have remained unrecognised if the disease, as it extended, had not ere long presented a series of cases which removed all doubt regarding its nature.

The premonitory symptoms of the dengue are almost the same as those of the fever which has been prevalent in Mauritius since 1866. There is at the outset a feeling of malaise, with great thirst, headache, and general lassitude. This is usually accompanied by constipation, and the urine is high-coloured. The face is flushed, the eyes red, and the temperature of the body high. When the eruption comes out, all these symptoms disappear, leaving behind only an eruption resembling roseola; sometimes confluent, sometimes distinct, according to the premonitory symptoms, and, as a pathognomonic sign of the disease, some tumefaction in one or more joints at a time, with acute and persistent pain. In reference to differential diagnosis, the swelling and the pain are the symptoms which definitively separate the dengue fever from the old form called paludal. The type of the fever further aids the diagnosis. It is purely inflammatory in the one case, remittent or intermittent in the other, sometimes even continued, and then it is almost always typhoid. There is unquestionably a very close resemblance between dengue and rheumatic fever. One would be the more apt to confound them, were it not that the eruption is a constant phenomenon of the former, which is further characterized by an entire absence of complications of the heart, eyes, or brain. Whatever may be the points of resemblance between the paludal fever and the dengue, this great distinction separates the two diseases, that the one is prone to relapse while the other is not.

The two sexes suffer equally from the dengue. Infancy alone seems to possess an immunity from this disease. Gouty and rheumatic individuals are most prone to its attacks.

This fever often becomes superadded to the ordinary fever of Mauritius, and, as a complication, it has been the cause of death in a large number of cases. Often also patients, having all the symptoms of this fever, have sunk under improper or badly-managed treatment.

The average duration of the attack, previous to the appearance of the eruption, has almost always been from twelve to twenty-four hours. The duration of the disease has varied greatly and indefinitely, according as one or more joints have been attacked, and according to the diathesis of the patient.

Therapeutic Indications.

1*st.* To favour the development of the eruption by treatment acting on the skin.

2d. To combat the fever by appropriate means, if it continues after the eruption has become developed.

3d. To employ local applications to subdue the swelling and pain of the joints.

The first of these indications is fulfilled by the administration of warm infusions of mint, borage, tea, or other aromatic plants, along with the solution of the acetate of ammonia, and sweet spirits of nitre. If there is any gastric disturbance, an emeto-cathartic should be given in the first instance. In the premonitory stage the patient should imbibe diluents *ad libitum.* In patients of the nervous diathesis delirium is sometimes present at the height of the fever which precedes and accompanies the eruption. It is the duty of the physician in such cases to allay all over-excitement by suitable means.

In the case of a young nubile girl, one must employ remedies with discrimination, according to the circumstances of the case.

The second indication.—The eruption having come out, as we have said, all the preceding symptoms, the fever, lassitude, and headache disappear, and leave the patient with only well-marked tumefaction, and acute pain in one or several of the large or small articulations.

But there are cases, and they are not uncommon, in which the fever assumes a more persistent character, in spite of energetic and well-directed treatment. In such cases the physician must recognise the engrafting, so to speak, of one fever upon another; and here the sulphate of quinia, combined with other suitable medicines, is of use.

This treatment, however, employed at the commencement of the fever, when the dengue was epidemic in Mauritius, always did more harm than good; it retarded the eruption—if it did not even completely prevent its development—to the great injury of the patient. It is necessary to assume an expectant attitude, and treat the patient for what may be expected in the course of the disease, reserving the right to change the line of treatment after a certain number of hours or days.

Third indication.—Swelling in one or more articulations, with pain, which is aggravated by the least pressure or movement, with nocturnal exacerbations. The ankles, the knees, and sometimes, but rarely, the great toe, in the lower extremity; and the shoulders, the wrists, and more particularly the small joints of the fingers, in the upper extremity, are the favourite sites of the swelling and pain.

We will run rapidly over the different applications employed for the relief of the affected joints. The most irritating and most soothing applications have each had their advocates and their successes. One need not be astonished at the active rôle which iodine and its compounds, especially iodide of potassium, have played in the treatment of the third and last phase of this disease. In combination with colchicum, digitalis, and laudanum, the iodide of potassium has acted almost as a specific. We have generally found liniments having chloroform as their basis, more useful than irritant liniments. Some drastic purgatives complete the treatment.

Besides the numerous cases which have rapidly recovered under the influence of the above treatment, others have been met with which, notwithstanding the greatest care, have gone on from the acute to the sub-acute, and finally to the chronic stage. Here also the iodide of potassium has proved useful, along with cold douches applied to the affected joints.

It may be noticed in passing that, in the chronic form, the articular surfaces of the phalanges are deformed to such a degree that all movement of flexion is, in the great majority of cases, rendered difficult, if not even impossible. Here also the preparations of iodine, applied externally by friction and administered internally, have a markedly beneficial effect.

During convalescence, care should be taken that the patient is not exposed to the poison of paludal fever; an attack of which never fails to bring back the pains of the dengue in as acute a form as at the outset of that disease itself. It is from neglect of this wise precaution, and because patients are liable to continual attacks of marsh fever, that one meets with so many lingering cases of the disease, in which the sufferers are, for the time, deprived of the free use of their hands and feet.

PORT LOUIS, *15th June* 1874.

ARTICLE VII.—*Dislocation Forwards of the Styloid End of the Ulna.* By T. E. PURDOM, M.B., C.M., L.R.C.S., L.R.C.P., House-Surgeon Royal Infirmary.

THE *rarity*[1] of this displacement will be sufficient excuse for putting it on record.

On the 8th of August last, a man named Duncan Weir got his hand pushed in between the rollers of a planing machine, his forearm being drawn in likewise in a slanting direction. The rollers, placed one above the other, gave a little, so far saving the arm. The hand and wrist were much twisted. On examination, the limb had a curious appearance, there being a hollow on the ulnar side posteriorly, while in front, just above the wrist, a hard swelling was felt and diagnosed to be the styloid end of the ulna, displaced forwards.

The elbow being fixed, extension being applied to the hand, and pressure to the projecting bone, reduction was easily accomplished, the bone giving an audible click as it returned to its place. The forearm and carpus were then placed in two well-padded Gooch splints.

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[1] Hamilton, in his Treatise on Fractures and Dislocations, p. 615, says that without a fracture, this lesion is quite rare; Sir Astley Cooper does not record a single instance.

Part Second.

REVIEWS.

THE DISEASES OF CHILDREN.

Lectures on the Diseases of Infancy and Childhood. By CHARLES WEST, M.D. Sixth Edition. London: Longmans: 1874.

A Practical Treatise on the Diseases of Children. By DRS MEIGS and PEPPER. Fifth Edition. London: H. K. Lewis: 1874.

THE attention paid to the diseases of children has been for some years steadily increasing in this country. Several of the larger hospitals have now their children's ward, and children's hospitals are to be found in nearly all our large towns. There must, therefore, be a considerable body of workers cultivating this branch of medicine.

Much good work has been done, but we cannot rid ourselves of the impression that the amount is far short of what might be expected. Certainly there is not in our literature that degree of activity, or a like discussion of opinions, in pediatrics, which we see in other subjects not more special. There is no lack of systematic treatises; but few works on special subjects have lately been produced. Papers and synopses of lectures do appear in journals, but not in any comparison with the opportunities which our hospitals must afford for excellent work. Many which have appeared are valuable, but it is long since the pediatric atmosphere has been disturbed by anything like a storm of conflicting opinions. It has not become stagnant, by any means, but the necessary changes are taking place so gradually that there is a perceptible want of freshness.

The reviewing of new editions of what may be regarded as the representative works of this country and of America has brought the subject fully under our consideration, and we would depart from the routine practice of reviewing the books only, and widen the field to the consideration of pediatrics in general, how work is likely to be productive, and the direction in which lies the work of the future.

Dr West's work we have lately specially noticed.[1] Of the new edition of Dr Meigs's well-known volume we can speak in the highest terms. It is a full and exhaustive encyclopædia of the subject, by men who have made themselves familiar with all that has been written bearing on it, and who have specially devoted themselves to its study. The books are in no sense rivals; every medical man should have them side by side on his shelves. The one a delightfully-written personal record of a clear mind and a keen observant eye; the other an exhaustive treatise, comprising an

[1] March 1874, p. 825.

excellent epitome of the work of others, combined with much valuable personal experience.

A superficial survey of pediatrics is sufficient to reveal how much it owes to Continental workers. English names are not wanting in its annals—on several subjects they hold precedence in time, in the description of diseases, but in point of numbers or in amount of work they cannot compare with those of France and Germany. The reason of this is well known, and need not detain us. It is no fault of our countrymen that the greater share of the structure is of foreign growth. At the same time it must be remembered that by the establishment of children's hospitals our opportunities of cultivating this field have been largely increased, and it will be to our discredit if we do not work.

Closer consideration equally shows that the greater bulk of the Continental work has lain in pathological research, and was accomplished at a time when pathological views prevailed which have now been abandoned, or so far modified that its value has to a certain extent diminished. Their clinical work, too, has been extensive and admirable, but performed under special and peculiar circumstances, such as we do not meet with in this country. The facts deduced from large foundling hospitals are not always applicable to general life.

The autopsy must always be the great guide and exponent of clinical work. We record, enumerate, and classify our cases according to the prevailing pathological ideas. As our views change, our former clinical work is to an extent depreciated. The same work has to be gone over again, cases have anew to be observed and recorded.

The progress of science is not the laying on of stone upon stone, it is a living structure, and the process of absorption should keep pace with new formation.

Pathology has made of late years enormous advances. Our ideas of tubercle, of the metamorphoses of inflammatory products, of lymphatic and connective tissues, have undergone a complete revolution. The clinical work of the past, on which the present fabric of pediatrics is based, as represented in our books, was mostly performed under the older ideas, and needs reviewing. The *real* facts of the past will ever remain, but they require sifting from the *apparent* facts only.

The progress of pediatrics appears to us to be retarded by allowing the views of former workers to bias our method of investigating cases, by working on too much in one groove, by continuing to cultivate ground which has already been well tilled, and by contenting ourselves with a comparison of our results with those which have gone before, instead of pushing on close to the advance in pathology, and working out the problems which pathologists have advanced.

The work of Meigs and Pepper is written after the French models, and, though admirable after its manner, they have imbued themselves so fully with the opinions of others, and worked so much in the same track, that there is a want of independent treatment or originality of thought. Attention has been paid to modify the handling of most of the subjects according to recent changes of opinion, such as the constitutional states of tuberculosis, scrofula, and rickets. But, in such changes, we have merely the embodiment of the opinions advanced fourteen years ago by Sir William Jenner. There is no effort at further development of these views, or of working out the modifications which arise therefrom in the characters of concurrent affections—a wide field, which remains yet to be cultivated, and one we would strongly recommend to the consideration of medical men. In the characters and special pathological tendencies of the various constitutional types will be found the explanation of the differences in individuals of the manifestations of one and the same agent, such as the exanthemata. By their study will be acquired the power of foreseeing dangers, and obtaining well-founded principles in the selection of our remedies. What the recognition of the gouty and rheumatic constitutions has been in furnishing us with the key-note of many local affections in the adult, so that of the tubercular, scrofulous, rickety, and syphilitic constitutions is in the child.

American physicians have greater opportunities for studying the diarrhœas of childhood than exist in this country. To this subject we turned, in the hopes that our American authors would have some independence of thought and freshness in the handling of it. But both our authors of Pennsylvania, and Dr Lewis Smith of New York, closely follow the French school, and elaborate their materials in conformation of, or comparison with, the results of French and German observers.

They adopt the usual division of non-inflammatory and inflammatory diarrhœa. This has always appeared to us an unsatisfactory mode of treatment. It is purely a pathological distinction, and has but the slightest clinical application. Dr West adopts the same classification, but expresses his dissatisfaction with it. His rendering inflammatory diarrhœa synonymous with dysentery, moreover, limits this class much more than others do who comprise under it nearly every form of chronic diarrhœa, together with those occurring "in the course of the eruptive fevers, particularly measles, and in that of typhoid fever."[1]

The great objection to this method of dealing with diarrhœa is, that, however satisfactory it is in pathology, it entirely breaks down when brought into practice, and in no way influences treatment.

Dr West remarks (p. 647):—

> "Even MM. Rilliet and Barthez, whose opportunities have been so extensive, and whose industry was so untiring, confess their inability to refer the symptoms that attend upon the different varieties of diarrhœa to any distinct and

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[1] Meigs and Pepper, p. 391.

invariable anatomical lesions. They remark that, not merely are exceedingly different appearances discovered after death in cases where the same symptoms have been observed during life, but that likewise there is often no proportion between the intensity of the two; and sometimes no morbid appearances are found, even where well-marked symptoms had existed."

"Practically," says Dr Lewis Smith, "it matters little whether we ascertain the inflammatory or non-inflammatory character of the disease, as we determine the proper mode of treatment from the symptoms and general condition of the patient."

We would not in the least undervalue the importance of the pathological researches so fully detailed in the works before us; but surely there is here room for some of the freshness of thought we desiderate. Are the anatomical lesions the *cause* of the symptoms and general condition? The mode in which the subject is treated of in our books tacitly implies, if it is not affirmed, that they are. The functional lesions, to our mind, are the real causes, even in cases where there are extensive anatomical changes, and that independently of the change in structure so frequently met with. This position can be well supported by an analysis of both the exciting causes, such as the atmospheric and dietetic, and also by the action of many of our drugs—such as pepsine, oxide of zinc, and nux vomica. Our present purpose, however, is not to discuss these points, but to indicate merely where generally-accepted opinions may be serviceably called in question.

On the subject of pneumonia, also, there is ample room for new work. Here past clinical research has been depreciated in value, and has to be renewed. The division hitherto adopted of "*lobar*" and "*lobular*," or, as Meigs prefers it, "*partial*" pneumonia, does not meet with the requirements of recent views of the pathological nature of the inflammatory products. The true acute or croupous pneumonia may be extremely partial, as has been pointed out in a recent paper in this Journal;[1] whilst catarrhal pneumonia may involve a whole lobe or the entire lung. What are the clinical features of this division of the subject? Again, what is the history of those broncho-pneumonias which so often end in phthisis, and which, in their pathological appearances, are so like, and are commonly mistaken for, tubercle, but differ totally from it? What is the clinical history, also, of "vesicular pneumonia"?

The introduction of the thermometer into clinical use has furnished us with the means of attaining greater accuracy of observation and record, and has increased our powers of diagnosis. Clinical work is now imperfect without its use. Experimental physiology has likewise thrown new light on perverted functions, and on the hidden actions of our remedies. In both of these directions much work remains to be done, and a fruitful field is open for cultivation.

In the department of therapeutics, much labour seems to us to have been wasted by the unscientific manner in which observations are conducted, and mainly by dealing with complex and varying states as if they were simple and always alike.

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[1] Clinical Observations on Pneumonia in Children. By William Stephenson, M.D. January and March 1874.

To cite as an example, what is more unsatisfactory than the deductions which are constantly drawn regarding the treatment of hooping-cough? The only true conclusion which can be come to from the method in which observations are in general made, is as to whether a certain remedy is, or is not, a specific, with the result that no specific has as yet been found. We would not in the least discourage the hunt for a specific remedy; but till that is found, can we not more profitably conduct our investigations so as to determine against which feature in the attack such a remedy may be found useful?

In Dr West's work we find the following note:—

> "I have made a few trials of the nitric acid in large doses, as recommended by Dr Arnoldi, and by Dr Gibb in his Treatise on Hooping-Cough; but cannot at all subscribe to Dr Gibb's statement, that 'it shortens the disease almost as effectually as quinine does intermittent fever.' The nitric acid has, within the past six years, fallen into comparative oblivion, and the last new specific, vaunted as loudly as if its advocates had not extolled other remedies before as equally infallible, is the bromide of ammonium. It has been employed among the out-patients of the Children's Hospital on a scale large enough to demonstrate its worthlessness."

Regarding these remedies as specifics, the criticism is just; but as against either in certain cases, it is not so. Both are of very great service, as many can testify; but have we as yet had pointed out the special indications, in a given case, for one or the other?

On the one hand, we have those who extol an acid treatment in hooping-cough, and on the other those who equally hold to an alkaline. Are we then to drift into scepticism, as many do, from such conflicting opinions, or throw in our lot on one side or the other? Or would it not conduce to more useful results if in our investigations we could arrive at some general principles whereby we can with confidence employ now one and again another remedy?

Such a result, however, can never be arrived at by the indiscriminate use of the same medicine in every case, and argument from the average duration or ratio of mortality as to the value of the treatment. Is hooping-cough a constant and unvarying factor? Like all other epidemic diseases, it has a varying "constitution." Moreover, in no other disease are the manifestations more modified and determined by the constitutional character of the patients; in no other affection are the phenomena more complex.

To take, for example, the frequency or duration of the paroxysms —the criterion so often taken to test the result of remedies—the phenomena of the disease are at first purely physiological, and except by a specific we cannot expect with any good result to check the manifestations of the poison. A time generally arrives when the physiological line is passed, and pathological conditions arise. Undue frequency or severity exists—an extremely complex state. This may have its origin in impaired function of the respiratory or

the nervous systems. Are we to treat all cases alike, and give our acids, our alkalies, or our nervine sedatives, according to the general pathology of the affection which we may have adopted? If the respiratory system is suffering, what is the condition? Is there scanty secretion, with a dry, irritable state of the mucous coat? or is this membrane relaxed, with a copious secretion? In the one case experience tells us that an alkaline treatment will be of most service; in the other, acids.

Whilst it is purely physiological that a certain irritation in the air-passages should produce the phenomena of coughing, hooping, and vomiting, it is pathological to have these symptoms produced by speaking, laughing, or the mere presence of food in the stomach. Increased sensitiveness to reflex action explains the condition; but this again in a complex state, that is, may arise under different states of the nervous system. An analysis of this state, therefore, is necessary before we can obtain the proper principles for the selection of the nervine sedative or tonic which will be of most service.

But it is not of hooping-cough we are treating, but of the method in which our investigations are to be conducted, and we have said enough to indicate our meaning. Instead of pitting a remedy against all comers in the garb of Pertussis, let us patiently investigate the conditions which give rise to the complex phenomena, and under what circumstances will one remedy more certainly act than another.

MM. Rilliet and Barthez have made this observation, that even in primary diseases a period arrives when the general condition holds sway over the local affection, and when the latter should be entirely disregarded, whilst the former claims all the attention of the medical attendant. This is exactly the point where our books are deficient; the subjects are therein treated under special diseases, and we miss the discussion of the general conditions, and the practical illustrations of treatment, which find full scope only in the clinical method of instruction. The clinical teaching of pediatrics is but sparingly conducted in our Schools. Medical men do not acquire their knowledge of the subject from lectures, or whilst they are students; and hence the very general impression that books fail where most they are wanted, in imparting assistance in the treatment of the general conditions common to many very different diseases. But this opens up a subject which space forbids us entering upon.

On the Absorption of Dead Bone. By Dr J. Coats, Lecturer on Pathology in Glasgow University.

After a few introductory remarks, a case is related in which necrosis of the femur, following amputation through the middle third of the thigh, necessitated the removal of two inches of the affected bone. A careful account of the microscopic appearance of sections of the diseased bone is given, the most important point in which is, that the Haversian canals, besides being as a rule much widened, presented round their circumference a well-marked eroded appearance, arising from the formation of Howship's lacunæ, which were in many cases occupied by giant cells. The borders of the bone elsewhere had the same eaten-out aspect, indicating an internal as well as a superficial absorption of the sequestrum. The author "can ascribe the erosion of the sequestrum only to a process going on after its death." A cross section of the necrosed bone and a diagrammatic representation of the giant cells occupying the lacunæ are engraved. The labours of Kölliker, Wegener, and Rustizky are briefly referred to, and the author remarks, "Hitherto observations have been confined to the absorption of living bone, but the facts recorded in the present paper seem to prove that a similar process is concerned in the absorption of dead bone." With the inference we entirely agree, but to the comparatively trivial matter of priority we may be allowed to take exception, as, in a contribution on this subject which appeared in our pages in October 1873, Kölliker's observations on eroded ivory pegs were referred to—observations identical with those of Dr Coats.

A Manual of Psychological Medicine: Containing the Lunacy Laws, the Nosology, Ætiology, Statistics, Description, Diagnosis, Pathology, and Treatment of Insanity; with an Appendix of Cases. By JOHN CHARLES BUCKNILL, M.D. Lond., etc.; and DANIEL HACK TUKE, M.D., etc. London: 1874.

IN reviewing the third edition of a well-known text-book by two such distinguished authors, it is not needful to go into a criticism of details. So much experience, learning, literary skill, and judgment, have been brought into use, that in the eight hundred pages of the book we have what one wishing to study insanity most needs to know. We have read no book in any language, and certainly none in English, which ought to be preferred for a text-book by those who wish to make a thorough study of the subject. Dr Blandford's book is too short to be consulted by those who have difficulties out of the usual course; and who that has to treat insanity can flatter himself that such difficulties may not turn up at any moment? The work of Griesinger, which has been translated into English, is no doubt a valuable one, the product of a superior mind, deeply acquainted with the subject, of ripe experience and extensive reading; but the book is now behind the time in so far as the studies of the last few years go; and we may expect no new editions from its lamented author. Besides, the English student cannot want those expositions of our law bearing upon insanity, and the useful advice which Dr Tuke gives to those who have to meddle with the legal question, from which our profession cannot escape, but in which they often do not appear to advantage.

In this edition the subject of classification has been very carefully considered. While not quite prepared to accept the late Dr Skae's system of classification, based upon the view that insanity is a disease of the brain, the authors are inclined to recognise it as leading one in the right direction. We have accumulated so much pathological knowledge on insanity that we cannot get on without classifying it; and an imperfect classification is better than none at all. Even those who profess to reject classification founded upon the symptoms, etiology, or pathology of bodily disease, and will only suffer the old terms—mania, melancholia, dementia, and idiocy—avail themselves of some of the other vesaniæ, taken from the nosologies they reject. If a man proclaim that he is going to rest satisfied with mental classifications, let him not use in his writings such definitions as epileptic insanity, puerperal insanity, or cretinism,—distinctions founded upon the pathological or etiological systems he rejects.

It appears to us that we cannot at present want either a classification based upon the mental symptoms, or one based upon pathology; but there is no classification as yet produced which embraces within its terms at once the cause, physical or mental, and the symptoms and course of the disease, physical or mental. Though favourable to Dr Skae's classification, we agree with Dr D. H. Tuke that the groups which he has generalized are often not distinguishable by their mental symptoms. But then Dr Skae himself acknowledged the necessity of an arrangement based upon mental as well as upon bodily symptoms. The truth is, there is no system of classification in insanity to which many objections cannot be made, and the real way of putting down a classification which, like Dr Skae's, has got into use, is not by objecting to it, but by proposing another one which, if more serviceable, has a very good chance of being adopted.

In the chapter devoted to the treatment of insanity, we naturally look to see what new remedies Dr Bucknill considers worthy of mention amongst the large number proposed. Of bleeding, tartar emetic, opium, and hyoscyamus, we have had enough; but can ergot of rye, or Calabar bean, or electricity, do something for a mind diseased? Dr Bucknill is too cautious to say anything in favour of the vegetable drugs, save that they have been "extolled in the West Riding Reports." As for electricity, there is now no doubt that we can pass the continuous current through any part of the brain we wish, and that we know what direction to give it in order to reach the tracts upon which we desire to act. We can at least modify the cerebral circulation to a considerable degree with the electric current. One objection to this powerful agent, no doubt, is the amount of time required in getting ready and administering the remedy; and another is the danger of untoward results, unless great care be taken. According to Hitzig, who ought to be an authority on the matter, the danger has been much exaggerated. It seems to us that one page minus four lines is not enough to do justice to the subject. It would have increased the value of the work if its authors had devoted at least three or four pages to the consideration of the kind of battery which may be used, the amount of electricity which may be safely passed through the brain, the varying physiological action of anode and kathode, the best place to apply the electrode, the precautions to be taken during the sitting, the cases which ought to be selected for treatment, and the nature of the results which may be hoped or expected to follow. It cannot be said that a text-book has fulfilled its object when it merely directs attention to papers in British or foreign periodicals or asylum reports, written upon an important subject, about which the reader is anxious to obtain some immediate information. This is the only omission of any consequence which has been noticed, and, take it all in all, the chapter on treatment is one of the best in the book.

The authors have got the assistance of Dr J. Batty Tuke to write the chapter on Morbid Histology. It must always be a difficulty where two or more men combine to write a book to preserve such an appearance of unanimity as to keep one chapter from being in open contradiction with another. Dr Sheppard, in his "Lectures on Madness," quotes Dr Bucknill to this effect:—"A large number of brains of the insane we have diligently investigated with a first-rate microscope. The results appear to us to have afforded no distinction between the sane and the insane brain."

Dr Bucknill's new colleague has no such doubts. Dr Batty Tuke will not go so far as Schroeder Van der Kolk, who does not remember to have performed during the last twenty-five years the dissection of an insane person without getting a satisfactory explanation of the phenomena observed during life; but he believes that morbid changes can be found in every insane brain, if the investigation is thoroughly worked out. Dr A. Voisin says he has never made an examination in a case of insanity (folie simple) of older duration than three months in which he did not find some morbid alteration. There is nothing succeeds like success; but we are not at the end of our suspicions that the enthusiasm of microscopists occasionally deceives them. It is notorious that histologists are very far from being agreed as to the normal structure of the human brain at any period of life: some appearances are treated as healthy which are thought to be morbid to others. Take, for example, the existence of perivascular spaces, and of granular corpuscles in the new-born child, and how are we to determine what is abnormal if we are still in doubt as to what is normal? Then, again, many pathologists will disagree with the following bold declaration of Dr Batty Tuke—a challenge to a whole school:—"The *fatty* degeneration of the various brain elements, so frequently spoken of by certain histologists, must be taken *cum grano.* Doubtless, there are many appearances noticeable in the cells and vessels which are very suggestive of their being of a fatty nature; but it will be found that the application of the various tests for oil fails to produce any evidence of its presence. The 'free oil globules' in the substance of the convolutions are, we think, scattered *débris* of glandular cells." Dr Batty Tuke may be right, but in that case he will establish a reputation upon the ruined monuments of many well-known microscopists. We have derived both pleasure and profit from reading Dr Tuke's chapter, which is, no doubt, a useful addition to the book. It is illustrated by some good plates.

The Student's Guide to Materia Medica. By JOHN C. THOROWGOOD, M.D., etc. London: J. and A. Churchill: 1874.

THIS volume forms one of a series published by the Messrs Churchill, as "guides" to students. One of the best known of this series is "The Student's Guide to Medical Diagnosis," by Samuel Fenwick, M.D. This volume on Materia Medica is a fit companion to the work just named. It is excellently arranged, well written, and is, on the whole, sound in its therapeutics.

The author, in his preface, assumes that every student is possessed of a copy of the British Pharmacopœia; and it is necessary that he should be possessed of that book to understand fully the various officinal preparations referred to in this work on materia medica. The reader will find in this little volume a very good "account of the chemical composition of medicines, ... and of the reactions which occur in applying tests of their purity," as well as a very good account of the actions and uses of medicines.

The book, however, is far from being faultless. We cannot praise his definition of "Iodism" (which is given in two different places in his book), as that state of running from the eyes and nose known by the name "Iodism." It is not quite accurate to describe the chloride of calcium ($CaCl_2$) as a "crystalline salt." The anhydrous salt, which alone is officinal, occurs in "dry white agglutinated masses." The crystalline form contains six atoms of water, but is not now used in medicine. Black wash contains three grains of calomel to the ounce of lime-water; not one grain, as stated by Dr Thorowgood. There is a curious mistake in the symbol for chloroform, being printed $CHCL_3$ instead of $CHCl_3$. The author has more than once committed the rather-too-common error of making *cum* govern the genitive, as Pulvis Cretæ Aromaticus cum *opii*, p. 166; and at p. 204 we find, Pil. Ipecac. cum *scillæ*.

The greatest number of mistakes is contained in the naming of plants. Dr Thorowgood is evidently perfectly ignorant that botanists have fixed laws which guide them in using or not using a capital letter when spelling the *specific* name of a plant. It is a pity that, in this otherwise excellent work, we should find the most of the names incorrect; as, for example, Hyoscyamus Niger for H. niger; Rosmarinus Officinalis for R. officinalis; Lavandula Vera for L. vera, etc., etc., etc. Again Ricin*is* Communis should be Ricin*us* communis. The author evidently does not understand the distinction between the leaves of the Arctostaphylos Uva-ursi, and the leaves of the common boxwood. After quoting from the Pharmacopœia the following description of the leaves of Uva-ursi—"leaves not dotted beneath nor toothed on the margin," he uses this sentence—"This is to distinguish them from the leaves of the *Red Whortleberry* and Common Box." Now, this test of the Pharmacopœia in no way helps to distinguish the leaves of Uva-ursi from the leaves of the Common Box, because it is perfectly accurate to say of the leaves of Box, "leaves not dotted beneath, nor toothed on the margin."

The above test helps only to distinguish them from the leaves of Red Whortleberry, Vaccinium Vitis-idæa, and from the leaves of Arctostaphylos alpina.

We believe that these and similar mistakes will be corrected in a second edition, which we hope soon to see issued. The book is one of the smallest we have on Materia Medica; and, on account of its brevity, will become a favourite with students.

Searches for Summer. Showing the Anti-Winter Tactics of an Invalid. By C. HOME DOUGLAS. Edin. and London: Wm. Blackwood and Sons: 1874.

THIS most excellent little work comes from the Messrs Blackwood at an opportune time, when those who dread the fitful climate of our British winter are beginning to make arrangements for flight to the sunny south.

The book is dedicated by the author to British and American Invalids; and by that large class, it will, no doubt, be most warmly welcomed. But we would take the liberty of saying that its pages will prove quite as interesting to the doctors as the invalids. It must be admitted that medical men are not "well up" in climate, and that their recommendation of health resorts is too frequently based on an imperfect knowledge of such places. Here, then, is a book most pleasantly and elegantly written, which furnishes us with almost everything that it is necessary to know concerning most of the fashionable and best winter residences. Its pages are replete with sensible practical hints as to routes, hotels, diet, and fares; while carefully recorded thermometric observations, taken by Mr Douglas himself, add considerably to the value of the volume as a guide to the selection of a suitable climate for invalids.

Not being an invalid himself, the author has thus been enabled to look with an unjaundiced eye on the features, climatic and others, of the numerous places he has visited: and his most sensible and practical observations are worthy of careful study. Gibraltar, Malaga, Cordova and Seville, Biarritz, Pau, Algiers, The Riviera, Jersey, Mentone, Nice, Cannes, San Remo, Genoa, and Florence, are all treated of in a racy easy style, which affords delightful reading for all who are interested in blue skies, orange groves, or steady temperature. We advise our medical brethren to lose no time in making themselves familiar with the information contained in *Searches for Summer*.

The Harveian Oration for 1874. By CHARLES WEST, M.D. London: Longmans, Green, and Co.

SURELY no more fitting theme could have been chosen for the Annual Harveian Oration at the London College of Physicians, than that selected by Dr West, namely, "Harvey and his Times." With that beautiful flowing English of which Dr West is so great a master, he here describes to us, with loving reverence, the life, the character, and the work of this great physician and discoverer. Harvey's genial, pious nature, his love of research, his deep humility, his merits as a discoverer, and his claims as a physician, are all set forth in this most interesting sketch. The publishers, too, have apparently emulated the grace of the orator in the elegance bestowed on the "get-up" of the essay.

On the Value of Certain Signs observed in Cases of Death from Suffocation, and on Death from Hæmorrhage in the New-born. By DAVID PAGE, M.D., F.C.S. Edin. and London: Wm. Blackwood and Sons.

THIS is a thesis which gained a gold medal, and is published by permission of the University of Edinburgh. It contains the results of some carefully-conducted experiments, which tend to elucidate some medico-legal questions in connexion with infanticide.

INFORMATION REGARDING MEDICAL EDUCATION AND EXAMINATIONS.

THE following are the Regulations of the General Medical Council on the subject of Medical Education and Examinations:—

I.—PRELIMINARY EXAMINATIONS.

1. That Testimonials of Proficiency, granted by the National Educational Bodies according to the subjoined list, may be accepted, the Council reserving the right to add to, or take from, the list.

List of Examining Bodies whose Examinations fulfil the Conditions of the Medical Council, as regards Preliminary Education.

(1.) UNIVERSITIES OF THE UNITED KINGDOM.

Oxford.—Examination for a Degree of Arts. Responsions, Moderations, Local Examinations (Senior), Certificate to include Latin and Mathematics.

Cambridge.—Examination for a Degree in Arts. Previous Examination. Local Examinations (Senior), Certificate to include Latin and Mathematics.

Durham.—Examination for a Degree in Arts. Examination for Students in their second and first years. Registration Examination for Medical Students. Local Examinations (Senior), Certificate to include Latin and Mathematics.

London.—Examination for a Degree in Arts. Matriculation Examination.

Aberdeen, Edinburgh, Glasgow, and St Andrews.—Examination for a Degree in Arts. Preliminary Examination for Graduation in Medicine or Surgery. Examination of (Senior) Candidates for Honorary Certificates under the Local Examination of the University of Edinburgh.

Dublin.—Examination for a Degree in Arts. Entrance Examination.

Queen's University (Ireland).—Examination for a Degree in Arts. Entrance Examination. Examination for the Diploma of Licentiate in Arts. Previous Examination for B.A. Degree.

(2.) OTHER BODIES NAMED IN SCHEDULE (A) TO THE MEDICAL ACT.

Royal College of Surgeons of England.—Examination conducted under the Superintendence of the College of Surgeons, by the Board of Examiners of the Royal College of Preceptors.

The Society of Apothecaries of London.—Examination in Arts.

Royal Colleges of Physicians and Surgeons, Edinburgh.—Preliminary Examination in General Education, conducted by a Board appointed by these two Colleges combined.

Faculty of Physicians and Surgeons of Glasgow.—Preliminary Examination in General Literature.

Royal College of Surgeons in Ireland.—Preliminary Examination, Certificate to include Mathematics.

Apothecaries' Hall of Ireland.—Preliminary Examination in General Education.

(3.) EXAMINING BODIES, IN THE UNITED KINGDOM, NOT INCLUDED IN SCHEDULE (A) TO THE MEDICAL ACT.

Royal College of Preceptors.—Examination for a First Class Certificate.

(4.) COLONIAL AND FOREIGN UNIVERSITIES AND COLLEGES.

Universities of Calcutta, Madras, and Bombay.—Entrance Examination, Certificate to include Latin.

M'Gill College, Montreal.—Matriculation Examination.

University of Toronto, King's College, Toronto, Queen's College, Kingston, Victoria College, Upper Canada.—Matriculation Examination.

King's College, Nova Scotia.—Matriculation Examination. Responsions.

Dalhousie College and University, Halifax, Nova Scotia.—Matriculation Examination.

University of Fredericton, New Brunswick.—Matriculation Examination.

University of Melbourne.—Matriculation Examination, Certificate to include all the subjects required by the General Medical Council.

University of Sydney.—Matriculation Examination.

Codrington College, Barbadoes.—1. English Certificate for Students of two years' standing, specifying the subjects of Examination. 2. Latin Certificate, or "Testamur."

Tasmanian Council of Education.—Examination for the Degree of Associate of Arts, Certificate to include Latin and Mathematics.

Christ's College, Canterbury, New Zealand.—Voluntary Examination, Certificate to include all the subjects required by the General Medical Council.

The Examiners for Commissions in the Military and Naval Services of the United Kingdom.—Certificate to include all the subjects required by the General Medical Council.

Cape of Good Hope.—Third Class Certificate in Literature and Science granted by the Board of Public Examiners.

South Australia—South Australian Institute, Adelaide.—Preliminary General Examination.

N.B.—A Degree in Arts of any University of the United Kingdom or of the Colonies, or of such other Universities as may be from time to time recognised by the General Medical Council, will be considered a sufficient testimonial of proficiency.

2. That it be recommended to the Licensing Boards not to accept the Certificate of Proficiency in General (preliminary) Education from any of the Bodies, the names of which are contained in the list annually circulated, unless such Certificate testify that the Student to whom it has been granted has been examined in:—1. English Language, including Grammar and Composition.[1] 2. Arithmetic, including Vulgar and Decimal Fractions. Algebra, including Simple Equations. 3. Geometry—First two books of Euclid. 4. Latin, including Translation and Grammar.

And in one of the following optional subjects:—Greek. French. German. Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.

3. That students who cannot produce any of the Testimonials referred to in the first Recommendation be required to pass an Examination in Arts, established by any of the Bodies named in Schedule (A) to the Medical Act, and approved by the General Medical Council.

II.—REGISTRATION OF MEDICAL STUDENTS.

1. Every Medical Student shall be registered in the manner prescribed by the General Medical Council.

2. No Medical Student shall be registered until he has passed a Preliminary Examination, as required by the General Medical Council.

3. The commencement of the course of Professional Study recognised by any of the Qualifying Bodies, shall not be reckoned as dating earlier than fifteen days before the date of Registration.

4. The Registration of Medical Students shall be placed under the charge of the Branch Registrars.

5. Each of the Branch Registrars shall keep a Register of Medical Students according to the subjoined Form:—

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[1] The General Medical Council will not consider any Examination in English sufficient that does not fully test the ability of the candidate,—*1st*, To write a few sentences in correct English on a given theme, attention being paid to spelling and punctuation as well as to composition. *2d*, To write a portion of an English author to dictation. *3d*, To explain the grammatical construction of one or two sentences. *4th*, To point out the grammatical errors in a sentence ungrammatically composed, and to explain their nature. *5th*, To give the derivation and definition of a few English words in common use.

Form for the Registration of Medical Students.

Date of Registration.	NAME.	Preliminary Examination and Date.	Place of Medical Study.

6. Every person desirous of being registered as a Medical Student shall apply to the Branch Registrar of the division of the United Kingdom in which he is residing, according to the annexed Form, which may be had on application to the several Qualifying Bodies, Medical Schools, and Hospitals; and shall produce or forward to the Branch Registrar a Certificate of his having passed a Preliminary Examination, as required by the General Medical Council, and a statement of his place of Medical Study.

Form of Application for Registration as a Medical Student.

I hereby apply to be registered as a Student in Medicine, in conformity with the Regulations of the General Council of Medical Education and Registration of the United Kingdom, for which purpose I submit the following particulars:—

NAME OF APPLICANT. (To be written in words at length.)		Preliminary Examination.	Date of Preliminary Examination.	Place of Medical Study.
Surname.	Christian Name.			

Applicant's Signature ———.
Address ———.
Date of Application ———.

To the Registrar of the Branch Council for ———.

N.B.—The above Form of Application, duly and legibly filled up, must be forwarded to the Registrar, post free, and be accompanied by a Certificate of the Applicant's having passed a Preliminary Examination, as required by the General Medical Council; and a statement of his place of Medical Study.

The Certificate of Examination must testify that the Student has been examined in,—1. English Language, including Grammar and Composition; 2. Arithmetic, including Vulgar and Decimal Fractions; Algebra, including Simple Equations; 3. Geometry—First two books of Euclid; 4. Latin, including Translation and Grammar. And in one of the following optional subjects:—Greek; French; German; Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.

7. The Branch Registrar shall enter the Applicant's name and other particulars in the Students' Register, and shall give him a Certificate of such Registration.

8. Each of the Branch Registrars shall supply to the several Qualifying Bodies, Medical Schools, and Hospitals, in that part of the United Kingdom

of which he is Registrar, a sufficient number of blank Forms of Application for the Registration of Medical Students.

9. The several Branch Councils shall have power to admit special exceptions to the foregoing regulations as to Registration, for reasons which shall appear to them satisfactory.

10. A copy of the Register of Medical Students, prepared by each of the Branch Registrars, shall be transmitted, on or before the 31st December in each year, to the Registrar of the General Council, who shall, as soon as possible thereafter, prepare and print, under the direction of the Executive Committee, an Alphabetical List of all Students registered in the preceding year, and supply copies of such authorized list to each of the Bodies enumerated in Schedule (A) to the Medical Acts, and through the Branch Registrars to the several Medical Schools and Hospitals.

11. The several Qualifying Bodies are recommended not to admit, after October 1870, to the final Examination for a Qualification under the Medical Acts, any Candidate (not exempted from Registration) whose name had not been entered in the Medical Students' Register at least four years previously.

In the case of Candidates from other than Schools of the United Kingdom, the Branch Councils shall have power to admit exceptions to this recommendation.

The Branch Councils are desired to take means to make these regulations known to the Medical Students at the various Medical Schools.

III.—Age for License to Practise.

1. That the age of twenty-one be the earliest age at which a Candidate for any Professional License shall be admitted to his final Examination; that the age shall, in all instances, be duly certified; and that a Return of any exceptions to this recommendation allowed by the Licensing Bodies, together with the reasons for such exceptions, be transmitted to the Branch Council of that part of the United Kingdom in which they have been granted.

2. That no License be obtained at an earlier period than after the expiration of forty-eight months subsequent to the Registration of the Candidate as a Medical Student.

IV.—Professional Education.

1. That the course of Professional Study required for a License shall comprehend attendance during not less than four Winter Sessions, or three Winter and two Summer Sessions, at a School recognised by any of the Licensing Bodies mentioned in Schedule (A) to the Medical Act.

2. That the following are the subjects without a knowledge of which no Candidate should be allowed to obtain a qualification entitling him to be registered:—1. Anatomy. 2. General Anatomy. 3. Physiology. 4. Chemistry. 5. Materia Medica. 6. Practical Pharmacy. 7. Medicine. 8. Surgery. 9. Midwifery. 10. Forensic Medicine.

Chemistry should include a knowledge of the principles of Chemistry, and of those details of the science which bear on the study of Medicine.

Medicine and Surgery should include a knowledge of Systematic and Clinical Medicine and Surgery, and also of Morbid Anatomy.

3. That it be recommended to the several Licensing Bodies that the courses of instruction required by them be framed in such a manner as to secure a due share of attention, both to preparatory branches and to those more strictly connected with the Practice of Medicine and Surgery; and that it be suggested accordingly to these Bodies, that their regulations should be such as to prevent attendance upon Lectures from interfering with Hospital and Clinical Study.

4. That the Council will view with approbation any encouragement held out by the Licensing Bodies to Students to prosecute the study of the Natural Sciences before they engage in studies of a strictly professional character.

V.—PROFESSIONAL EXAMINATION.

1. That it is desirable that the different Licensing Bodies should combine their Examinations, when this is practicable, so as to secure that the knowledge of every Practitioner whose name appears on the Register shall have been tested in all the subjects of Professional Education which the Council has determined to be essential, viz.:—1. Anatomy. 2. General Anatomy. 3. Physiology. 4. Chemistry. 5. Materia Medica. 6. Practical Pharmacy. 7. Medicine. 8. Surgery. 9. Midwifery. 10. Forensic Medicine.

2. That those Licensing Bodies which have not already done so, be requested to furnish a statement of the dates of their Examinations and of the modes in which such Examinations are conducted, whether by written, oral, or practical Examination, and of the length of time a Candidate is under Examination in each or all of these ways; and that the Registrar transmit these Reports to the Members of the Council, in order that they may be taken into consideration at the next meeting of the several Branch Councils.

3. That the Professional Examination for any License be divided into two parts; the first embracing the primary or fundamental branches directly connected with the practice of Medicine and Surgery; that the former be not undergone till after the close of the Winter Session of the second year of professional study; and the latter, or final Examination, not till after the close of the prescribed period of professional study.

4. That the Examination in Physics, Botany, and Natural History may be undergone at an earlier period than the first Professional Examination.

5. That the Professional Examinations be conducted both in writing and orally; and that they be practical in all branches in which they admit of being so.

6. That not less than two Examiners, or one Examiner with an Assessor, should be present at every Oral Examination.

7. That the Oral Examinations should be so far public as to be open at least to the Medical and Surgical Graduates, or members of the Examining Body.

8. That the questions to be answered in writing should be so numerous, and embrace such a variety of the details of each subject, as may adequately test the proficiency of the Candidate; and that they should be submitted to the whole body of Examiners for consideration and revision, if desirable, before being proposed to the Candidates.

9. That the written answers should be submitted to more than one of the Examiners.

10. That excellence in one or more subjects should not be allowed to compensate for failure in others.

11. That if a Candidate be rejected for failure in any one subject, he should be re-examined in all.

12. That Examiners should only be elected for definite periods, with power of re-appointment.

13. That the Professional Examinations be held by the several Licensing Bodies, except in special cases, at stated periods, to be publicly notified.

14. That returns from the Licensing Bodies in Schedule (A) be made annually, on the 1st of January, and in the subjoined form, to the General Medical Council, stating the number and names of the Candidates who have passed their first as well as their second and third Examinations, and the number of those who have been rejected at the first and second and third Examinations respectively; and that the Registrar forward a sufficient number of forms, with a notice for their being returned in due time.

Table of Return of Professional Examinations, and their Results.

Licensing Bodies.	Qualifications.	No. Passed.			No. Rejected.		
		1st Exam.	2d Exam.	3d Exam.	1st Exam.	2d Exam.	3d Exam.

15. That for the future the Licensing Bodies, which do not already do so, distinguish separately in their Returns the names and numbers of Candidates examined, and the numbers of those passed and rejected at the examinations for each of the qualifications conferred.

16. That it is not desirable that any University of the United Kingdom should confer any degree in Medicine or Surgery, whether that of Bachelor, Doctor, or Master, upon Candidates who have not graduated in Arts, or passed all the Examinations required for the Bachelorship in Arts, or the Examinations equivalent to those required for a degree in Arts.

THE following paper on a subject which is now exciting much attention, from the pen of one who has the best right to dogmatize on the question, seems suitable for a Students' Number.— [ED. *E. M. J.*]

LIMITATION OF EXAMINATIONS.

The *principle* of our existing system of examinations everywhere is, that Candidates may be examined in any part of every branch. Nothing is excluded. The examination is coextensive with the whole range of the branch. The branches examined in for the double qualification are at least ten in number. They comprise Botany, Zoology, Chemistry, Anatomy, Physiology, Materia Medica, Surgery, Practice of Medicine, Midwifery, and Medical Jurisprudence; besides Clinical Medicine and Clinical Surgery, together with, at some Boards, Practical or Surgical Anatomy, Operations, Practical Chemistry or Testing, and Practical Pharmacy. There are, it will be seen, ten systematic branches.

Now, in regard to every one of these without exception, it may be truly said that it has already attained to *gigantic* proportions. As representing each, we have one or more systematic works, each in one or more volumes of no mean size. Surgery may be said to be represented by Holmes's "*System of Surgery,*" in five large octavo volumes; Medicine by Dr Reynolds's "*System of Medicine*" (when finished), in four or five equally large volumes; Botany by Professor Balfour's "*Class-Book,*" in one immense volume; and so of the other branches.

We have said that the *range* of examination in each branch is coextensive with the whole extent of each; and the "Systems" just named or referred to may be taken as indicating the extent of each. An inspection of the published examination question-papers of different Boards, and experience of the questions put *vivâ voce* at different Boards, will serve to show that the actual range is as wide as we have represented it to be—coextensive in fact with the whole subject-matter of each branch.

A moment's reflection must, we think, convince any one who thinks at all on the subject that such a system must be very prejudicial to the cause of sound medical education. The sad thing is, that individual Examiners and Corporate Examining Boards, getting used to things as they are, and forgetting what they themselves felt when Students and Candidates, don't think at all about it, but go on in the beaten track. It is plain enough that, were a system of examination now for the first time to be devised with no guidance from any prior system, the one which now everywhere obtains would, if proposed, be at once *denounced;* would at once be pronounced impracticable—monstrous in fact, and ruinous to the work of education. It would be scouted as requiring of Candidates attainments utterly beyond their power, as perplexing to Students, and of necessity involving a system of cramming in study, so as to get up something of everything, simply in order to pass; and as making study under the guidance and with the aid of the persons called "grinders" an absolute necessity with Students.

That we may avoid the charge of exaggeration, though in what we have said we hold that we are in no degree chargeable therewith, we are free to admit that Examiners generally are discreet in their work, and have some fair regard to the position in which Candidates stand. Still, we maintain also that all Examiners are not discreet—that not a few are the very reverse of this; and, as far as onr observation goes (extending now over a period of nearly thirty years), that one great fault of most Examiners is, that they look for a minuteness of knowledge, and a ripeness of judgment on the part of Candidates, which at twenty or twenty-two years of age is altogether beyond their powers.

Apart from its marring the work of Students all through their curriculum—or rather because of its doing so—one effect of our existing system is, that no Candidate, however diligent he may have been as a Student, or however well prepared he may on the whole be, can meet his Examiner in any branch with assured confidence. He cannot be certain that he will not be examined on some subject he has not been able to overtake, or which he may now have forgotten; and, what is often too little heeded by Examiners, all Candidates require very gentle handling. Nothing is easier than to dash a Candidate and spoil him for the other Examiners he has yet to meet. We have many times seen this effect produced by a single Examiner, and have known good Students rejected through this mischance. And here we cannot forbear quoting the remark of Sir Robert Christison, that "nothing is easier than to reject a Candidate trained at a different school from that of his Examiner." Would that those whom it concerns would well weigh all that is included under it! The truth of it cannot be gainsaid, and it speaks volumes. It bespeaks a cruel and a gross injustice to Candidates, and it proclaims a radically unsound system of Medical Education.

In proceeding to indicate what in our opinion would be a sounder system, and an efficient mode of working a plan of Definition and Limitation, as well in teaching as in examining, we shall begin by narrating what a friend of ours once told us of his examination in Physiology at this University. Dr Alison was the Professor of Institutes, and had already published his "Outlines of Physiology." Our friend had not attended Alison's Course, but he had studied and was familiar with every page of the "Outlines." Although labouring under this disadvantage, our friend felt perfectly at his ease in presenting himself before the Professor. He felt assured that he would not be questioned on anything not contained in the book. And so, he told us, the event proved. The first question put to him was like bidding him open the "Outlines" at a particular page, which he knew. He answered the question in the Professor's own words. And so of the whole examination. It was all based on the book, and the answers were all given in the words of the book. The work in question, as every one knows, is one of *moderate* dimensions, such as any Student could thoroughly master within the time at his command, and it was at the time the standard work on Physiology. It then contained all that any medical man needed to know of that important branch, and our friend knew it thoroughly—by heart,—and with the understanding also.

A like tale was given us by another professional friend of his examination at this University on the most important branch of all, to wit, Pathology and Practice of Medicine. He was examined in it by Alison also, the Professor of that branch. He also had not attended Alison's Course, but he had carefully studied and had thoroughly mastered his "Outlines of Pathology and Practice." It was in every particular the same story over again. The book was a manageable one. Our friend was able, while pursuing other studies, to "read, mark, learn, and inwardly digest" it. This, by the way, is the right thing with every branch: it is what is desirable above all things, but *impossible as things are.* Had it been Aitken's work on Pathology and Practice (6th edition), in two large volumes, and one of these a super-huge volume, our friend could not have passed as he did; and we question much whether he would have had that thorough knowledge of this whole branch which he acquired from Alison's book, had he been *obliged* to get it up from Aitken's work exclusively. We are instituting no comparison just now between the respective merits of the two works. All we mean to indicate is, that Aitken's work is too large for any Student to overtake thoroughly—that its very size is enough to preclude any Student, even had he nothing else to do, from *mastering* that cardinal branch. If, to do the best he can, he pick and choose here and there in the book, and digest well the selections he has made, he runs the risk of being examined on the topics he has passed over. If, again, he attempt to overtake the whole, he runs the risk of knowing no one part of it well. He is sure to be overwhelmed by the mass of details, which are "such," to use an expression of Dr Carpenter's on a kindred subject, "as no head can carry."

This also is a pregnant remark: "*Details such as no head can carry!*" Is not this what our existing system of medical education entails? Nothing defined; everything included; everything exacted; and the head crammed with details it cannot carry! The whole work of education is thus marred—marred in the pursuit of details for the Examining Board:—not for use at the bedside in after life,—and forgotten as soon as they have served their end at the Board. And that which is one main end of professional education is in a great measure frustrated in that pursuit of details—namely, the "*discipline of the mind!*"

> "Knowledge and wisdom, far from being one,
> Have ofttimes no connexion."

To come now to the point.

The most effectual way of giving practical effect to the principle of a "Definition and Limitation of the Areas of Instruction and Examination," would be for the General Medical Council to enact, that it shall be done in each branch by means of BOOKS. By *instruction*, here, we do not mean teaching, but study. We would leave teachers free. But of this hereafter. We say *Books*. The principle of this method is not a new, or an untried one. It is in use, in certain departments, at the Universities of Oxford and Cambridge, in the Halls of Theology, etc.

The requisite books, it is true, do not at present exist. Admirable as are many of the best text-books we now have on every branch of medical study, they are vastly too large—too voluminous—for students; nor are they all of them in other respects exactly what is desirable for the purpose now in view. We would unhesitatingly point to Alison's two sets of "Outlines" as models of what is desirable in respect of *size*,—and we may add, in respect also of the *heed* paid to the *relative values* of particular subjects. And we would point to another, recently published, as coming very near to what we deem the mark. It is Dr Roberts's Hand-book of Medicine. It, like others, is too large for students, albeit it is on the most cardinal subject of all—that which treats of what is to be the main and the daily business of our lives as medical men. But "*non omnia possumus*" is to be kept in mind in respect of this as of other branches; and it is the disregard of this principle that lies at the root of the evils of our existing system. The peculiar excellence of Dr Roberts's book is, on the one hand, its completeness and comprehensiveness,—and, on the other, and above all, the formal divisions and subdivisions of its matter (or what we are in the habit of calling *milestones*) in which it abounds, and in the unsparing use of *italics*. Both these help students wonderfully. They arrest their attention: they are props for the memory.

We have said that the books needed do not at present exist. Let the Medical Council, however, once give its sanction to the principle, and the books *will* be forthcoming. They would appear in great abundance, and there would be abundance for teachers and examiners to choose from. Rome was not built in a day; and it is not necessary that the new system should be in working order to-morrow. We should not grudge it the time needed for the preparation of the British Pharmacopœia,—nor even, say, a ten years.

We would not propose that the Medical Council should provide the books, as it did the Pharmacopœia, that is, that it should have them prepared under its own superintendence. It would suffice were it to decree, that on every branch, the examination should be based on *books*, leaving every examining board free to select such books as it pleases. Only (through a standing committee) it might indicate the kind and size of books to be used, and in some way give encouragement for the preparation of them, or exercise some authoritative supervision over the books named by the boards. We do not desire to dogmatize as to details. Much would require to be considered, and no inconsiderable time might be needed to mature a scheme.

This, however, would be the essential feature of any such scheme,—namely, that at the outset of his career, every student should know the book on each branch, from which, or out of which, he would be examined, at the time open to him, by the board be *selects*. The book may be changed at *any* time, but not *for him*. Edinburgh University might have one particular book for Physiology,—Glasgow University another. Should a Glasgow student purpose

graduating at Glasgow, but change his mind and proceed to Edinburgh, he must needs make up his mind to be prepared on the book in use in Edinburgh, and *vice versa*. Let each examining board have its own set of books,—changing them at its pleasure. Only let due notice be given of the change, and let it apply only to students beginning their studies after its promulgation.

One great result of such a scheme (and that within a marvellously short time too) would be, that we should have a large number of books on every branch. Each, too, would serve as a guide, or as a model, for every one subsequently brought out. Teachers would have not one but several to choose from, and on which to base their teaching, for, doubtless, it would lead to our teaching becoming (what is the best of all teaching) textual. Teachers would have an *embarras des richesses*. But the great gain would be to the student. He would know precisely on what footing he stood when examined in any branch. And he would make it his business to "get up" thoroughly, and to master the prescribed book. Aye, would he not, as he does not now! He would no longer be, as at present he is, distracted in his studies and in his specific work. And, while, under such a system, the examinations might in fairness be made (as they ought to be) as *stringent* as at present they are of necessity *lax*; the results as regards students, as regards educational work, would be as satisfactory as heretofore they have been much the reverse.

One special feature in such a scheme would be, that the books would be (or should be) proportioned as to *size* to the relative importance of each branch, and therefore as to the time required to be given to each. At present Botany, and Zoology, and Chemistry, stand on an even footing with Anatomy, Physiology, and Materia Medica; and, at some boards we know, it is as difficult to pass on the first three of these as on the last three! As it is, in some schools, under existing arrangements, the branches which of all others demand the most time and attention, receive the least. We mean Pathology and Practice of Medicine and Midwifery. The theoretical branches absorb the far greater (and an undue) measure of the student's regards.

As we have said, we would leave teachers absolutely free. We would put no restrictions on "the liberty of prophesying." Only, as under such a system as we propose, the examinations would dominate the teaching, the prophets would unavoidably have to adapt their instructions to the examination-books. So much the better for the quality of the teaching!

One word more. Leaving teachers free, we would leave each examination-board as free as possible in the selection of its examining books. Yet we would have each controlled so far by the General Medical Council. The Council should have at least a *veto* on any of the books selected, should satisfy itself that every one of them is really suited for the purpose intended. At a school where the teachers are also examiners, as in the Universities of Scotland, a teacher might be the author of a text-book on his own particular branch. It were but natural that he should propose his own book as the examination book on that branch. And yet it might be much too large for the purpose—such a book as students could not overtake without encroaching on the time and attention required for other branches. In such a case, the Council should, we think, have it in its power to refuse it, and to insist on some other being selected. The necessity, however, for such interference would be of short duration. Teachers becoming authors would soon become conformists to the requirements of the General Medical Council.

We conclude these remarks with what seem to us golden words—words that well deserve the earnest attention of all teachers and examiners. "There is at present, fortunately, no deficiency of zeal or industry on the part of the Medical Students in this, or, I believe, in any other School of Medicine in this country. But it seems to me that, on the one hand, the number and the minute details of scientific medical works are formidable and perplexing to some; and, on the other, that individual portions of the study, which may excite peculiar interest, or promise early distinction, attract a larger share of the attention of others, than their importance in relation to the whole range of medical science, or in reference to the practical objects for which medical science is cultivated, will fairly warrant. On both accounts it seems important that *the whole extent of the studies most intimately connected with the practice of medicine should be fairly laid before the student in as small a compass as possible.* It is with this intention that the following outlines have been composed." —ALISON, in *Preface* to "Outlines of Physiology."

Had we on every branch outlines based on these views, giving the foundation-principles and the essential details of each (omitting perplexing details) and within as small a compass as possible, and were the pass-examinations to be based exclusively on such books, we should have far better educational results than we have or can have under the existing *omnium* system. With what comfort would students work! With what satisfaction would candidates face their examiners!

Take Surgery, for example, and contrast Syme's book on that branch, in one moderately-sized volume, with Erichsen's on the same, in two thick, closely-printed volumes. Set six students to get up their Surgery from the one, and six others from the other book, the whole twelve having the same time given them to do their work in. Which would have the most complete,—the most substantial knowledge of Surgery *as a whole?* Which best meet their examiner, and give him most satisfaction? It would be those that had given their days and their nights to Syme. And so of other branches. We grasp at the shadow, and we lose the substance.

The following pages contain a tabular abstract of the regulations of the various Licensing Boards, as well as a list of the Hospitals, Dispensaries, etc., attached to our Scotch Medical Schools; also the regulations for the Army, Indian, and Navy Medical Services. The space at our disposal does not allow of more detailed information. But, in point of fact, the regulations of all Licensing Boards now correspond much more closely than they used to do, and the regulations of the General Medical Council afford a key to the general requirements of all of them. For special information, application should always be made to the Secretaries of the Licensing Boards; or, in the case of the Universities, recourse may be had to the published Calendars.

The *Preliminary Examinations* are usually held before the commencement, and at the end, of the Winter Session,—viz., in October, March, or April—sometimes also at the end of the Summer Session. The Professional Examinations in Universities are usually after the Winter and during the Summer Sessions; in Edinburgh, however, the first Professional is held in October as well as April. The other Licensing Boards' examinations are held at various periods throughout the year. Special examinations, under circumstances of urgency, can be held at almost any time; but they, of course, entail considerable addition to the expense.

COURSE OF STUDY REQUIRED BY THE VARIOUS BOARDS OF THE UNITED KINGDOM.

	Age.	Anatomy.	Dissections.	Chemistry.	Practical Chemistry.	Materia Medica.	Physiology or Institutes of Medicine.	Surgery.	Practice of Medicine.	Midwifery.	Medical Jurisprudence.	Pathology or Morbid Anatomy.	Botany.	Natural History.	Practical Pharmacy.	Clinical Surgery.	Clinical Medicine.	Hospital Attendance.	Practical Midwifery.	Dispensary or Out-door Practice.	Vaccination.
	Years.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	
Edinburgh University, M.B. & C.M., . .	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	3 mo., or 6 cas.	6	
University of Glasgow, M.B. & C.M., . .	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	do.	6	
University of Aberdeen, M.B. & C.M., .	21	6	6	6	3	6	6	6	6	6	3		3	3	3	6	6	24	do.	6	
University of St Andrews, M.B. & C.M., .	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	do.	6	
London University, M.B., ...	21	6	12	6	1 crs	1 crs	6	6	6	1 crs	1 crs	1 crs			1 crs	2 yrs.	2 yrs.	4 yrs.	20 cas.	6	
University of Durham, M.B. & M.D., . .	21																				
Dublin University, M.B., ...		6	6	6	3 ms	3	3	6	6	6	3		3				9	24	6 mo.		
" " Surgical Diploma, .		12	18	6	3	6	18	12	6	6	3		3			27	27	27			
The Queen's University of Ireland, M.D.,		12	12	6	3	6	12	6	6	6	3		3	3	3 mos.	12	12	24	3 mo.		
Royal College of Physicians, London, .	21	12	12	6	3	3	12	6	12	3	3	6	3		3		9	24	20 cas.		
Royal College of Physicians, Edinburgh,	21	6	6	6	3	3	6	6	6	3	3	3	3		3	3	6	24	6 cases		
King and Queen's Col. of Phys. Ireland, .	21	6	12	6	6	6	6	6	6	6	6		6			6	21	27	6 mo.		
Royal College of Surgeons, London,* . .	21	12	12	6		3	12*	12	6	3					3	27*	9*	33			Cert.
Royal College of Surgeons, Dublin, . .	21	18	18	6	6	3	18	18	6	3	3					18	9	27			
Royal College of Surgeons, Edinburgh, .	21	12	12	6	3	3	3	6 or 12	6	3	3	3			3	6 or 12	6	24	6 cas.	6	Cert.
Faculty of Phys. and Surgeons, Glasgow,	21	12	12	6	3	3	3	6 or 12	6	3	3				3	6 or 12	6	24	6 cas.		
For Double Qualification by Royal College of Phys. and Surg. of Edinburgh,	21	12	12	6	3	3	3	6 or 12	6 or 12	3	3	3			3	6 or 12	6 or 12	24	6 cas.	6	Cert.
For Double Qualification by Royal College Phys. Edinburgh, and Faculty of Physicians and Surgeons of Glasgow,	21	12	12	6	3	3	6	6 or 12	6	3	3	3			3	6 or 12	12	24	6 cas.		
Apothecaries' Hall, England, ...	21	12	6	6	3	3	6		12	3	3	6	3		Appr.		27	27	20 cas.		9 mo.
" " Ireland, ...	21	6	12	6	3	3	6	6	6	6	3		3		Appr.	9	18	27	20 cas.		

English Poor-Law Board.—Candidates for the appointment of Medical Officer are required to be registered under the Medical Act, and must be legally qualified to practise both Medicine and Surgery, in virtue of Diplomas or Licenses granted by competent legal authority in England, Scotland, or Ireland.

Information respecting exceptions to these regulations under various circumstances, and other details as to the order in which, according to some Licensing Bodies, the courses should be taken out, etc., must be obtained by consulting the published Charts of the Colleges, etc. Students should apply to the Secretary to each Board which they intend to pass for a detailed copy of its Regulations.

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* Students from the Schools of Scotland are admitted to examination at the Royal College of Surgeons of England, if they have followed the course of study required by the regulations of the Royal College of Surgeons of Edinburgh. Students in Scotland, therefore, are not required to attend more than one course of Physiology, six months Clinical Surgery, six months Clinical Medicine, and twenty-four months Hospital.

MEDICAL SCHOOLS OF SCOTLAND, 1874–75.

WINTER SESSION.

Subjects.	University of Edinburgh.	School of Medicine, Edinburgh.	University of Glasgow.	Anderson's University, Glasgow.	University of Aberdeen.	University of St Andrews.
Anatomy, Systematic and Practical, with Demonstrations.	Professor Turner.	Dr Handyside.	Professor A. Thomson.	Dr George Buchanan.	Professor Struthers.	...
Physiology, or Institutes of Medicine.*	Professor	Dr Bell Pettigrew.	Professor A. Buchanan.	Dr E. Watson.	Professor Ogilvie.	Professor Oswald Bell.
Chemistry, and Practical Chemistry.	Professor C. Brown.	Dr Macadam.	Professor J. Ferguson.	Dr Thorpe.	Professor Brazier.	Professor Heddle.
Materia Medica and Therapeutics.	Professor Christison.	In Summer.	Professor Cowan.	Dr Morton.	In Summer.	...
Practice of Medicine.	Professor Laycock.	Dr Haldane.† Dr Muirhead. Dr Grainger Stewart.	Professor Gairdner.	Dr M'Call Anderson.	Professor Macrobin.	...
Surgery.	Professor Spence.	Dr Watson.† Dr Jos. Bell. Dr Chiene. Dr John Duncan.	Professor Macleod.¶	Dr Dunlop.	Professor Pirrie.	...
Midwifery.	Professor Simpson.	Dr J.M.Duncan.	Professor Leishman.	In Summer.	...	...
Natural Philosophy.	Professor Tait.	Mr Lees.	Professor Sir Wm. Thomson.	Mr Forbes.	Professor Thomson.	Professor Swan.
Natural History.	Professor Wyville Thomson.	...	Professor Young.	...	Professor Nicol.	Professor Macdonald.
General Pathology.	Professor Sanders.	Dr Wyllie.	...	...	...	...
Clinical Medicine.	Professors Laycock, Maclagan, and Sanders.	Drs Haldane,‡ Balfour, G. Stewart, and J.M.Duncan.	The Physicians of the Royal Infirmary.		Drs Smith, Beveridge, and Fraser.	...
Clinical Surgery.	Professor Lister.	Dr Watson.† Mr Annandale.	The Surgeons of the Royal Infirmary.		Drs Pirrie, Kerr, and Ogston.	...

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* This course is equivalent to that given under the name of General Anatomy and Physiology in the English Schools. Special schedules are issued by the London Boards for their Scotch students, which should always be inquired for.

† These are not conjoint courses, but separate ones by the gentlemen named.

‡ This is a joint course.

¶ Dr Cameron also lectures extra-murally on Systematic Surgery, at 151 George Street, between 11 and 12.

MEDICAL SCHOOLS OF SCOTLAND, 1875.

SUMMER SESSION.

SUBJECTS.	UNIVERSITY OF EDINBURGH.	SCHOOL OF MEDICINE, EDINBURGH.	UNIVERSITY OF GLASGOW.	ANDERSON'S UNIVERSITY, GLASGOW.	UNIVERSITY OF ABERDEEN.
Practical Anatomy and Demonstrations.	Professor Turner.	Dr Handyside.	Professor A. Thomson.	Dr George Buchanan.	Professor Struthers.
Botany.	Professor Balfour.	...	Professor A. Dickson.	Mr Hennedy.	Professor Dickie.
Materia Medica.	...	Drs Moinet and Craig.	...	...	Professor Harvey.
Midwifery.	...	Drs Keiller * and Macdonald.	...	Dr Wilson.	...
Medical Jurisprudence.	Professor Maclagan.†	Dr Littlejohn.†	Professor Simpson.†	...	Professor Ogston.†
Comparative Anatomy.	Professor Turner.	Dr Handyside.	...	...	Prof. Nicol.
Histology.	Professors * and Sanders.	Drs Wyllie and Pettigrew.	...	...	Professor Struthers.
Practical Chemistry.	Professor Crum Brown.	Dr Macadam.	Professor J. Ferguson.	Dr Thorpe.	Prof. Brazier.
Natural Philosophy.	...	Mr Lees.	...	...	...
Natural History.	Professor Wyville Thomson.	...	Professor Young.	...	Prof. Nicol.
Clinical Medicine.	Professors Laycock, Maclagan, and Sanders.	Drs Haldane,‡ Balfour, G. Stewart, and J. M. Duncan.	The Physicians of the Royal Infirmary.		Drs Harvey, Smith, and Beveridge.
Clinical Surgery.	Prof. Lister.	Dr Watson.* Mr Annandale.	The Surgeons of the Royal Infirmary.		Drs Pirrie, Kerr, and Ogston.

Operative Surgery is taught during the Summer by Drs Bell, Chiene, and Duncan. Instruction in Vaccination is also given at the Royal Public Dispensary, Edinburgh, on Wednesdays and Saturdays at 12, both Summer and Winter, by Dr Husband; at the Faculty Hall, Glasgow, on Mondays at 12, by Dr Dunlop; and at the Royal Infirmary, Glasgow, on Mondays and Thursdays at 12 o'clock, by Dr Tannahill. Medical Psychology and Insanity are taught in Summer by Dr Laycock and Dr J. B. Tuke. The Diseases of Children by Dr Stephenson, and the Diseases of the Eye by Dr Argyll Robertson.

* These are not conjoint courses, but separate ones by the gentlemen named.

† Drs Simpson and Ogston deliver their courses only in Winter. Dr Littlejohn gives courses during both the Winter and Summer Sessions. Dr Maclagan also lectures during both Summer and Winter. The Winter Course is chiefly intended for law students, but is open to medical students also.

‡ This is a joint course.

⁂ For additional Summer Courses on special subjects, see the Prospectus of each School.

LIST OF HOSPITALS, DISPENSARIES, ETC., IN CONNEXION WITH THE MEDICAL SCHOOLS OF SCOTLAND.

EDINBURGH.

ROYAL INFIRMARY, including LOCK HOSPITAL. Upwards of 560 Beds. Visits daily from 12 till 2 P.M. Physicians—Drs Bennett, Laycock, Maclagan, and Sanders, Professors of Clinical Medicine; Professor Simpson (for Diseases of Women); Drs D. R. Haldane, G. W. Balfour, and Grainger Stewart, Clinical Lecturers; Dr J. Matthews Duncan (on Diseases of Women). Assistant Physicians—Drs Claud Muirhead and Brakenridge. Pathologist, Dr Pettigrew.

Surgeons—Mr Lister, Professor of Clinical Surgery; Professor Spence; Dr P. H. Watson; Mr Annandale; and Dr Joseph Bell. Assistant Surgeons, Drs J. Duncan and J. Chiene. Consulting Surgeons, Dr Dunsmure and Dr Gillespie. Ophthalmic Surgeons, Mr Walker and Dr Argyll Robertson. Dental Surgeon, Dr John Smith.

CONVALESCENT HOUSE, Corstorphine. Visiting Medical Officer, Dr Chiene.

CHALMERS HOSPITAL FOR THE SICK AND HURT. 24 Beds for medical and surgical patients. Physician, Dr Halliday Douglas. Surgeon, Dr P. H. Watson.

ROYAL MATERNITY HOSPITAL. 36 Beds; 245 in-patients and 336 out-patients annually. Consulting Physicians, Drs Moir and Graham Weir. Physicians, Drs Keiller, Ziegler, Matthews Duncan, and Professor Simpson. Consulting Surgeon, Dr Dunsmure.

ROYAL HOSPITAL FOR SICK CHILDREN. 60 Beds; average number of out-patients, about 5600. Consulting Physicians, Professor Sir Robert Christison, Dr C. Wilson, Dr Graham Weir, and Dr Matthews Duncan. Consulting Surgeon, Professor Spence. Physicians, Drs Stephenson, R. Peel Ritchie, J. Linton, and J. Dunsmure, jun. Extra Physicians, Drs J. Andrew and J. Cumming. Surgeon-Dentist, Dr Smith. Pathologist, Professor Sanders. Ophthalmic Surgeon, Dr Argyll Robertson.

ROYAL PUBLIC DISPENSARY AND VACCINE INSTITUTION. About 12,700 patients annually. Medical Officers, Professors Sanders and Spence, Drs Ritchie, Stephenson, Cairns, Linton, Husband, D. Wilson, Moinet, and Alex. Sinclair, Physician-Accoucheurs, Drs Keiller, Matthews Duncan, Stephenson, Cairns, Wilson, and Andrew. Superintendent of Vaccination, Dr Husband. Medical Secretary, Dr Andrew. Clinique daily at 2 P.M. Vaccination on Wednesdays and Saturdays at 12 noon. Apothecary, Mr R. Urquhart.

NEW TOWN DISPENSARY. About 10,000 patients annually. Medical Officers, Drs Cunynghame, Brakenridge, Affleck, Cadell, Dunsmure, Wyllie, Underhill, and Cumming. Physician-Accoucheur, Dr Angus Macdonald. Superintendent of Vaccination, Dr Affleck. Medical Secretary, Dr Cunynghame. Clinique daily at 2 P.M. Vaccination on Tuesdays and Fridays from 12 to 1.

ROYAL ASYLUM FOR THE INSANE. About 660 patients. Physician, Dr Clouston.

EYE INFIRMARY, 6 Cambridge Street, Lothian Road. Surgeons, Benjamin Bell, Esq., F.R.C.S., and Dr Joseph Bell, F.R.C.S. Assistant-Surgeon, Dr J. Kirk Duncanson. Open daily at 1 P.M. Average number of patients annually, 900.

EYE DISPENSARY, 54 Cockburn Street. About 2000 patients annually. Surgeons, Mr Walker, Dr Wilson, and Dr Argyll Robertson. Open Mondays, Wednesdays, and Fridays, at 1 P.M. Clinical instruction during the summer session.

EAR DISPENSARY, 54 Cockburn Street. Drs T. Keith and Jackson. Tuesdays at 12. Average, about 20 cases daily.

Dental Dispensary, 38 Cockburn Street. Consulting Surgeon, Professor Spence. Consulting Physician, Dr Sanders. Dental Surgeons, Dr Orphoot, Mr Hutchins, Dr Roberts, Dr Hogue, Mr Knox Chisholm, Mr Swanson. Assistant Dental Surgeon, Mr Chisholm, jun. Daily, 9 to 10 A.M. Average number of patients, 4000 per annum.

GLASGOW.

Royal Infirmary. 583 Beds. Visits daily at 9 A.M. Physicians, Drs W. T. Gairdner, Perry, M'Laren, M'Call Anderson, and Scott Orr. Physicians to out-patients, Drs Lindsay, Charteris, Wood Smith, and D. C. Black. Surgeons, Drs E. Watson, Dewar, G. H. B. Macleod, George Buchanan, and Morton. To out-patients, Drs Dunlop, Patterson, R. Watson, Smart, and Cameron. Pathologist, Dr Joseph Coats. Superintendent, Dr M. Thomas.

Lock Hospital. 81 Beds. Medical Officers, Drs James Dunlop, H. C. Cameron, and A. Paterson. In-patients, 520.

Lying-in Hospital and Dispensary. 24 Beds; in-patients, 360; out-patients, 700. Physician-Accoucheurs, Drs J. G. Wilson and R. D. Tannahill. Assistant-Physicians, Drs R. T. Paton, G. Miller, H. Miller, and M. Hunter.

University Lying-in Hospital, 152 Wellington Street. Medical Officers, Professor Leishman, Physician *ex officio*. Physicians, Drs John Wilson, Gavin P. Tennant, Murdoch Cameron. Dispensary for the Diseases of Women, on Mondays, Wednesdays, and Fridays, at 12 o'clock noon.

Royal Asylum for the Insane. About 680 patients. Physician-Superintendent, Dr A. Macintosh. Open to Students on payment of a small fee.

Eye Infirmary. 24 Beds; 132 in-patients; 3139 out-patients annually. Physician, Harry Rainy, M.D. Consulting Surgeon, Dr G. Buchanan. Surgeons, Thomas Reid, M.D., and H. C. Cameron, M.D. Assistant Surgeons, Matthew Charteris, M.D., R. Watson, M.D., T. S. Meighan, M.B.

Ear Dispensary. About 400 patients annually. Surgeon, Dr Dewar. Open on Tuesdays, Thursdays, and Saturdays, at 3 P.M.

Dispensary for Skin Diseases. About 1400 patients. Physician, Dr M'Call Anderson. Practical Courses in Diseases of the Skin and Ear, during May, June, and July. The Dispensary is open on Mondays and Wednesdays at 4 P.M., and on Tuesdays for Diseases of the Ear at the same hour.

Ophthalmic Institution. Consulting Physician, Dr Charles Ritchie. Surgeon, Professor Macleod. Acting Surgeons, Drs J. R. Wolfe, and R. Bell. Assistant Surgeon, Dr Nairne. Open daily from 1 to 3 P.M. A Course of Lectures and Clinical Instruction during the winter and summer months.

Glasgow Dispensary for Diseases of the Ear, 241 Buchanan Street. During the Summer Session a Course of Lectures on Aural Surgery, and Practical Instruction in the Treatment of Ear Disease, is given to the Students attending the Clinique. Average number of cases treated, 800 annually. Surgeon and Lecturer, James Patterson Cassells, M.D., M.R.C.S. Lond.

The **Hunterian Museum** is open to Students of Medicine, for purposes of study, on purchase of the printed catalogue.

ABERDEEN.

Royal Infirmary. Upwards of 300 Beds. Visits daily at 12 o'clock. Physicians, Drs Harvey, Smith, and Beveridge.

Surgeons, Drs Kerr, Pirrie, A. Ogston, and Will. Ophthalmic Surgeon, Dr Davidson. Pathologist, Dr Rodger. Dental Surgeon, Mr Williamson.

General Dispensary, Lying-in and Vaccine Institution. 7000 patients annually. Medical Officers, Drs Duncan and Brown; Messrs Smith, Paterson, Rodger, and Fraser. Physician-Accoucheur, Dr Inglis. Dental Surgeon, Mr De Lessert. Visits daily at 9.30 A.M. Vaccination every Wednesday at 3 P.M.

LUNATIC ASYLUM. Above 300 patients. Consulting Physician, Dr Macrobin. Resident Physician, Dr Robert Jamieson.

EYE INSTITUTION, General Dispensary Buildings, Guestrow. Surgeon, Dr Davidson. Open daily, except Sunday, at 2.30 P.M. Clinical Instruction on Diseases of the Eye, and the use of the Ophthalmoscope. Average, 600 patients annually.

ARMY MEDICAL DEPARTMENT.

6 WHITEHALL YARD, S.W.

QUALIFICATIONS AND EXAMINATION OF CANDIDATES FOR COMMISSIONS IN THE ARMY MEDICAL SERVICE.

1. Every candidate desirous of presenting himself for admission to the Army Medical Service must be unmarried, and not under 21 nor over 28 years of age. He must produce a Certificate from the District Registrar, in which the date of birth is stated; or, if this cannot be obtained, a declaration before a magistrate from one of the parents or other near relative, who can attest the date of birth, will be accepted. He must also produce certificates of moral character, one of them from the parochial clergyman, if possible.

2. The candidate must make a declaration that his parents are of unmixed European blood, and that he labours under no mental or constitutional disease, nor any imperfection or disability that can interfere with the most efficient discharge of the duties of a medical officer in any climate.[1]

3. The candidate must possess two diplomas or licenses, one to practise Medicine, and the other Surgery in Great Britain or Ireland, and must be registered under the Medical Act in force at the time of his appointment.

4. Certificates of registration, character, and age must accompany the declaration when filled up and returned.

5. Candidates will be examined by the Examining Board in the following compulsory subjects, and the highest number of marks attainable will be distributed as follows:—*a*. Anatomy and Physiology, 1000; *b*. Surgery, 1000; *c*. Medicine, including Therapeutics, the Diseases of Women and Children, 1000; *d*. Chemistry and Pharmacy, and a practical knowledge of drugs, 100. (The examination in Medicine and Surgery will be in part practical, and will include operations on the dead body, the application of surgical apparatus, and the examination of Medical and Surgical patients at the bedside.) The eligibility of each candidate for the Army Medical Service will be determined by the result of the examinations in these subjects only. Examinations will also be held in the following voluntary subjects, for which the maximum number of marks will be—French and German (150 each), 300; Natural Sciences, 300. The knowledge of Modern Languages being considered of great importance, intending competitors are urged to qualify in French and German. The Natural Sciences will include Comparative Anatomy, Zoology, Natural Philosophy, Physical Geography and Botany with special reference to Materia Medica, and the number of marks gained in these subjects will be added to the total number of marks obtained in the obligatory part of the Examination by candidates who shall have been found qualified for admission,

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[1] His physical fitness will be determined by a Board of Medical Officers, who are required to certify that the candidate's vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses. A moderate degree of myopia would not be considered a disqualification, provided it did not necessitate the use of glasses during the performance of operations, and that no organic disease of the eyes existed. Every candidate must also be free from organic disease of other organs, and from constitutional weakness or other disability likely to unfit him for military service in any climate.

and whose position on the list of successful competitors will thus be improved in proportion to their knowledge of modern languages and natural sciences.

6. After passing this examination, every candidate will be required to attend one entire course of practical instruction at the Army Medical School on—(1) Hygiene; (2) Clinical and Military Medicine; (3) Clinical and Military Surgery; (4) Pathology of Diseases and Injuries incident to Military Service.

7. At its conclusion, the candidate will be required to pass an examination on the subjects taught in the School. If he give satisfactory evidence of being qualified for the practical duties of an Army Medical Officer, he will be eligible for a commission as surgeon.

8. During the period of his residence at the Army Medical School each candidate will receive an allowance of 5s. per diem with quarters, or 7s. per diem without quarters, to cover all costs of maintenance; and he will be required to provide himself with uniform (viz., the regulation undress uniform of a surgeon, but without the sword).

9. All candidates will be required to conform to such rules of discipline as the Senate may from time to time enact.

The daily rates of pay of the officers of the Medical branch of the Hospital Department of our Army are as follows:—

1. The daily rates of pay of Medical Officers of the Army are as follow:—Director-General, special; Surgeon-General £2, after twenty-five years' service £2, 5s., after thirty years' service £2, 7s., after thirty-five years' service £2, 10s.; Deputy Surgeon-General £1, 10s., after twenty-five years' service £1, 12s., after thirty years' service £1, 15s., after thirty-five years' service £1, 17s.; Surgeon-Major 17s. 6d., after fifteen years' service £1, after twenty years' service £1, 4s., after twenty-five years' service £1, 7s.; Surgeon, on appointment 10s., after five years' service 12s. 6d., after ten years' service 15s., after fifteen years' service 17s. 6d. Charge pay: the officer in medical charge of an army in the field, of 10,000 men and upwards, £1 daily; of 5000 men and upwards, 15s. daily; of less than 5000, 10s. daily. Or, in medical charge of a colony where the number of commissioned officers and enlisted men is 1500 and upwards, 5s. daily.

2. A Surgeon must pass such examination as the Secretary of State for War may require, before he can be promoted to the rank of Surgeon-Major.

3. A vacancy in the rank of Surgeon-Major, occasioned by death or promotion, shall, unless it be expedient that it be otherwise filled, be given to the senior qualified Surgeon of the Department. If a vacancy arise from any other cause it shall be filled by a qualified Surgeon, recommended by the Commander-in-Chief and with the approval of the Secretary of State. In cases of distinguished service, however, a Surgeon, if qualified, may be promoted without reference to seniority.

4. All promotion from the rank of Surgeon-Major to that of Deputy Surgeon-General, and from the rank of Deputy Surgeon-General to that of Surgeon-General, shall be given by selection for ability and merit.

5. Service of medical officers upon the West Coast of Africa shall be voluntary, except for those who enter the Department especially for African service.

6. Each year or portion of a year shall be allowed to reckon double towards retirement, but not towards increased pay, provided that the officer shall serve at least 12 months on the West Coast of Africa.

7. For each year's service on the Coast, a medical officer shall be entitled to a year's leave at home, and for every additional period beyond a year he shall have an equivalent extension of leave.

8. Officers who may enter the Army Medical Department expressly for service on the West Coast of Africa, and those who may volunteer for that service from the General Department, after this date, shall receive double pay while actually serving on the Coast.

9. Officers who enter the Department expressly for service on the West Coast of Africa shall pass the same examination as other medical officers, but

they may be admitted at a later age. They will be required to complete three years' actual service on the Coast, after which they shall be eligible for general service. If it shall be certified by a Medical Board that any such officer is unfit for further duty on the West Coast of Africa, he may be employed elsewhere, notwithstanding that he may have served for less than three years on the Coast.

10. Good Service Pensions shall be awarded to the most meritorious medical officers of the army, under such regulations as shall be from time to time determined. Six of the most meritorious medical officers of the army shall be named Honorary Physicians, and six Honorary Surgeons to the Queen.

11. Medical officers shall have the right to retire on half-pay after 20 years' service; medical officers of the rank of Surgeon-Major or Surgeon, shall be placed on the retired list at the age of 55, and all Surgeons-General and Deputy Surgeons-General at the age of 65 years.

12. A medical officer placed on half-pay by reduction of establishment, or on the report of a medical board in consequence of wounds or ill-health caused in and by the discharge of his duties, or on account of age (under Rule 11), shall be entitled to half-pay at the following daily rates:—Surgeon-General, after thirty years' service, £1, 17s. 6d.; twenty-five years, £1, 13s. 6d.; twenty years, £1, 10s. Deputy Surgeon-General, after thirty years, £1, 5s. 6d.; twenty-five years, £1, 2s. 6d.; twenty years, £1, 1s. Surgeon-Major, after twenty-five years, £1; twenty years, 16s. 6d.; fifteen years, 13s. 6d.; ten years, 11s. Surgeon, after ten years, 10s.; after five years, 8s.; under five years, 6s.

13. The rate of half-pay awarded to officers retiring for their own convenience, after twenty years' service on full pay, shall not exceed one-half of their full pay at the time of retirement.

ARMY MEDICAL SCHOOL.

ROYAL VICTORIA HOSPITAL, NETLEY.

President of the Senate.—Sir William M. Muir, K.C.B., M.D., Director-General of the Army Medical Department.

Members of the Senate.—Sir Ranald Martin, C.B., Physician to the Indian Council; Sir Alexander Armstrong, Director-General Naval Medical Department; The Principal Medical Officer, Royal Victoria Hospital; Surgeon-General T. Longmore, C.B., Professor of Military Surgery; Surgeon-General W. C. Maclean, Professor of Military Medicine; William Aitken, M.D., F.R.S., Professor of Pathology; E. A. Parkes, M.D., F.R.S., Professor of Military Hygiene.

Assistant Professors.—Staff-Surgeon-Majors T. H. Porter, W. H. Webb, and F. S. B. F. De Chaumont, M.D., Staff-Surgeon J. D. Macdonald, M.D., F.R.S., R.N., and Surgeon F. H. Welch.

Candidates for Commissions in the Army, and in the Queen's Indian Service, proceed to Netley after passing the Examination at London. At Netley they attend the Medical and Surgical Practice of the Royal Victoria Hospital, and learn the system and arrangements of Military Hospitals. During four months they attend the lectures given by the Professors and Assistant-Professors, and go through a course of practical instruction in the Hygienic Laboratory and Microscopical Room. The lectures and practical instruction are intended to explain the specialities of Military Medical Practice, attention being directed to gunshot and other wounds, surgical arrangements in the field during action and sieges, means of transport, field hospitals, tropical diseases and their means of investigation, service in India and in the various colonies, the sanitary arrangements in peace and war, and the means of carrying out the sanitary regulations. Every opportunity is taken of practising operations on the dead body, and practical points of a like kind.

INDIAN MEDICAL SERVICE.

INDIA OFFICE, WHITEHALL, S.W.

ALL natural-born subjects of Her Majesty between twenty-two and twenty-eight years of age at the date of the examination, and of sound bodily health, may be candidates for the appointment of Surgeon in Her Majesty's Indian Medical Service. They may be married or unmarried.

They must subscribe and send in to the Military Secretary, India Office, Westminster, proofs of their qualification similar to those required by the Army Medical Department, at least a fortnight before the date fixed for the examination.

The regulations and subjects for examination are the same as for the Army Medical Department, with the addition of Hindustani to the voluntary subjects. Passage allowance to India on appointment will be given, or a passage provided. When passages are provided on board the Indian troop-ships, a charge for messing will be made at the rate laid down in the Royal Passage Warrant of 1865. Pay at 10s. a day will be allowed from the date of passing final examination at the Army Medical School.

Indian allowances and time of service for pension will reckon from date of arrival in India. The period of residence at the Army Medical School will reckon as service for the full-pay pension only.

The duties will be those hitherto performed by the medical officers of the East India Company's Service, with the exception of those relating to European troops.

Surgical instruments are provided in India by the Government for the use of medical officers.

When Surgeons have served five or more years they will be examined in the following manner as a test for promotion:—

A series of printed questions, prepared by the Surgeon-General of the Presidency, will be sealed and sent to the principal medical officers of stations where Surgeons may be eligible for examination. It will be the duty of the principal medical officer of the station to deliver these sealed questions to the Surgeons, and to see that they are answered without the assistance of books, notes, or communication with any other person. The answers are to be signed, and delivered sealed to the principal medical officer, who is to send them, unopened, to the Surgeon-General of the Presidency, together with a certificate from the Surgeon-Major of the regiment, or other superior medical officer, that the Surgeon has availed himself of every opportunity of practising surgical operations on the dead body.[1]

The Surgeon will also be required to transmit, together with his answers to the Surgeon-General of the Presidency, a medico-topographical account of the station where he may happen to be at the time, or of some other station where he may have been resident sufficiently long to enable him to collect the necessary information for such a report. Failing this, he will send a medico-statistical report of his regiment for a period of at least twelve months.

If the Surgeon-General of the Presidency is satisfied with the replies to the questions, and with the certificates and medico-topographical or statistical report, the Surgeon will be held qualified for promotion.

The Surgeon will thus be subjected to three separate examinations within the first ten years of his service, each examination having a definite object. The first, to ascertain, previous to his admission into the service as a candidate, his scientific and professional education, and to test his acquirements in the various branches of professional knowledge; the second, after having passed through a course of special instruction in the Army Medical School, to test his knowledge of the special duties of an army medical officer; and the third, previous to his promotion, to ascertain that he has kept pace with the progress of medical science.

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[1] The Surgeon may see this certificate before it is sent to the Surgeon-General.

The promotion of Surgeons will be regulated by length of service, and not as heretofore, by succession to vacancies in a fixed establishment of officers of the higher grades.

Surgeons of twelve years' service who shall have passed the prescribed examination in professional subjects, will be promoted to the rank of Surgeon-Major.

In cases, however, of emergency, or when the good of the service renders such alteration desirable, it shall be competent for the Secretary of State for India in Council to shorten the several periods of service above mentioned, in such manner as he shall deem fit and expedient.

With a view to maintain the efficiency of the service, all medical officers of the rank of Surgeon-Major shall be placed on the retired list when they shall have attained the age of fifty-five years, and all Surgeons-General and Deputy Surgeons-General when they shall have attained the age of sixty-five years. But as respects Surgeons-Major who entered the service prior to the 13th January 1860, this rule shall be relaxed, and an officer who has attained the age of 55 years without having obtained the rank of Deputy Surgeon-General shall be permitted to remain in the service for three years more, on his perfect competency and fitness being certified in such manner as the Secretary of State for India may direct. In any special case where it would appear to be for the good of the service that the officer should continue in employment, he may be so continued, subject in each case to the sanction of the Secretary of State for India in Council.

With a view of promoting the efficiency of the service, it has been further determined that the tenure of office by a Deputy Surgeon-General shall, as in the case of Surgeons-General, be limited to five years; officers being, however, if not disqualified by age, eligible either for employment for a second tour of duty in the same grade, or for employment in the higher grade of Surgeon-General by promotion thereto.

The rank of Surgeon-General and Deputy Surgeon-General conferred upon officers of the Indian Medical Service under the royal warrant of 10th May 1873 is to be considered as substantive rank.

These officers, on vacating office at the expiration of the five years' tour of duty, will be permitted to draw *in India* respectively an unemployed salary of 1200 rupees per mensem in the former, and 900 rupees in the latter case, for a period of six months from the date of their vacating office, after which they will be placed while unemployed on the rate of pay laid down for officers of corresponding rank in Europe.

NAVY MEDICAL DEPARTMENT.

Admiralty, 9 New Street, Spring Gardens, S. W.

REGULATIONS RELATIVE TO THE EXAMINATION OF CANDIDATES FOR COMMISSIONS IN THE MEDICAL SERVICE OF THE ROYAL NAVY.

Candidates for admission to the Naval Medical Service must subscribe and send to the Medical Department, Admiralty, proofs of their qualifications, etc., similar to those required by the Army Medical Department. The regulations and subjects for examination are also similar.

After passing the examination, every candidate will be required to attend one entire course of practical instruction in the Medical School at Netley, on —(1) Hygiene; (2) Clinical and Naval and Military Medicine; (3) Clinical and Naval and Military Surgery; (4) Pathology of Diseases and Injuries incidental to Naval and Military Service.

At its conclusion, the candidate will be required to pass an examination on the subjects taught in the School. If he give satisfactory evidence of being qualified for the practical duties of a Naval Medical Officer, he will be eligible for a commission as Surgeon.

During the period of his residence at the Netley Medical School, each candidate will receive an allowance of 5s. per diem with quarters, or 7s. per diem without quarters, to cover all cost of maintenance; and he will be required to provide himself with uniform—viz., the regulation undress uniform of a Surgeon, but without the sword.

The full and half pay of Naval Medical Officers is in accordance with the following scale:—Full-pay: Inspector-General of Hospitals and Fleets—On promotion or under twenty-five years' service, £2, 5s.; ditto or above twenty-five years' service, £2, 6s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £2, 10s. Deputy Inspector-General of Hospitals and Fleets—On promotion or under twenty-two years' service, £1, 11s.; ditto or above twenty-two years' service, £1, 12s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 18s. Staff Surgeon—On promotion or under twenty years' service, £1, 3s.; ditto or above twenty years' service, £1, 4s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 10s. Staff Surgeon 2d Class—On promotion or under fourteen years' service, 18s.; ditto or under seventeen years' service, £1; and for each additional year of service 1s. a day more until the maximum is reached—namely £1, 2s. Surgeon—Under five years' service, 11s.; under eight years' service, 12s. 6d.; under eleven years' service, 14s.; under fourteen years' service, provided he passed his examination for Staff Surgeon 2d Class while under ten years' service, 15s. 6d.; above fourteen years' service, ditto, 17s. Half-pay: Surgeon—Under five years' service, 6s.; under eight years' service, 8s.; under eleven years' service, 10s.; above eleven years' service, provided he passed his examination for Surgeon while under ten years' service, 11s. Staff Surgeon 2d Class—On promotion or under fourteen years' service, 11s.; ditto or under seventeen years' service, 13s.; ditto or above seventeen years' service, 14s. Staff Surgeon—On promotion or under twenty years' service, 16s.; ditto or above twenty years' service, 16s. 6d.; and for each additional year of service 6d. a day more until the maximum is reached—namely, 18s. 6d. Deputy Inspector-General of Hospitals and Fleets—On promotion or under twenty-two years' service, £1, 1s.; ditto or above twenty-two years' service, £1, 2s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 7s. Inspector-General of Hospitals and Fleets—On promotion or under twenty-five years' service, £1, 11s.; ditto or above twenty-five years' service, £1, 12s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 18s.

PRELIMINARY EXAMINATIONS for the DIPLOMAS of the ROYAL COLLEGES of PHYSICIANS and SURGEONS of EDINBURGH, during the Year 1873–74.

I. The *Preliminary Examination* in *General Education* for the Double Qualification in Medicine and in Surgery conferred conjointly by the Royal Colleges of Physicians and Surgeons, and also for the separate Diploma of each College, for 1874–75, will embrace the following subjects:—

1. *English Language*, including Grammar and Composition.
2. *Arithmetic*, including Vulgar and Decimal Fractions.
3. *Algebra*, including Simple Equations.
4. *Geometry*; First Two Books of Euclid.
5. *Latin*; Translation from Latin into English, Parsing, and rendering English correctly into Latin, the Latin words being supplied.
6. One of the following subjects at the option of the candidate: (1.)

Greek; (2.) *French;* (3.) *German;* (4.) *Natural Philosophy,* including Mechanics, Hydrostatics, and Pneumatics.

II. In *Latin*, the books prescribed to be translated from are either Cicero de Senectute et de Amicitia, or Horatii Carmina, Lib. II. et III.; and the candidate, besides selecting either of these two at his option, will be required to translate a passage from an unprescribed author.

In *Greek*, the books required are, Herodotus' History, Book I., and Homer's Iliad, Book II. On each occasion, translation from both the books prescribed is required, also parsing from the passages translated, and derivations of English words from the Greek.

In *French*, the book prescribed is Voltaire's Henriade. Parsing and translation of short sentences from English into French are also required.

In *German*, the book prescribed is Schiller's Wilhelm Tell. Parsing and translation of short sentences from English into German are also required.

III. The examinations will be held on the following days, beginning each day at twelve o'clock:—Tuesday, October 20th, and Wednesday, October 21st, 1874; Tuesday, April 20th, and Wednesday, April 21st, 1875; and Saturday, July 24th, and Monday, July 26th, 1875. On each occasion the subjects of the first day's examination will consist of English, Latin, and Geometry; and those of the second day, of Arithmetic, Algebra, and the optional subjects.

Candidates are required to give in their names to the officer of either College not less than two days prior to the day of examination.

Each candidate shall pay a fee of ten shillings previous to the examination. In the event of the candidate being unsuccessful, he shall be allowed to appear again for examination without paying a fee.

IV. The examinations will be conducted according to the following regulations:—

1. The competence of the candidate will be ascertained by means of written exercises. Candidates whose success amounts to a certain minimum will be admitted.

2. Each candidate must bring with him a card having his name, place of birth, and an address that will find him by post distinctly written on it.

3. The exercises on each of the subjects must, in every case, be written on separate papers; and the candidate must attach his signature and his address to each sheet of his written paper before giving it in to those who superintend the examination.

4. Books must not be employed, nor may assistance be given by one candidate to another, during the examination. Those who violate this necessary rule shall forfeit, for the season, the right of being examined.

5. The decision of the examiners will be intimated to each candidate as soon as possible. Those who pass the examination will receive certificates to that effect. In the case of those who are successful in part of the examination only, the subjects in which they have passed will be recorded, and they will not be again examined in the branch or branches in which they have been successful.

V. A certificate of having passed all the required subjects of the above examination, entitles the possessor, on commencing attendance on medical classes, to be registered as a Medical Student in the form required by the regulations of the General Medical Council, and, provided the candidate passes in three books of Euclid, is also admitted *pro tanto* by the Medical Faculty of the University of Edinburgh as an equivalent for the corresponding subjects of their matriculation examination.

A list of Examining Boards in the United Kingdom and in the Colonies, whose certificate is received by the Royal Colleges, on the recommendation of the General Medical Council, as equivalent to the above, will be found in the Appendix to the Regulations of the Colleges.

WILLIAM HENRY LOWE, *President Royal College of Physicians.*
JAMES SIMSON, *President Royal College of Surgeons.*

EDINBURGH, 2d *June* 1874.

Frequent inquiries having been made as to the exact nature of the Preliminary Examination for the Diploma of the Royal Colleges of Physicians and Surgeons of Edinburgh, the Secretaries have supplied the following papers, which were given out at the examination of 25th and 27th of July last.

FIRST DAY.—COMPULSORY.

ENGLISH.

The candidate is required:—

1. To write a passage dictated by the examiner, with strict attention to spelling and punctuation.

2. To give the meaning and derivation of at least eight of the following words:—

Definition, anticipate, circumstance, supersede, reference, observation, superfluous, scientific, indissoluble, constitution, approximate, incapacity.

3. To explain the following quotation, and parse fully the two first lines:—

> "But as we often see, against some storm,
> A silence in the heavens, the rack stand still,
> The bold wind speechless, and the orb below
> As hush as death: anon the dreadful thunder
> Doth rend the region."

4. To write a short essay on "Autumn; its features, its employments, and its recreations."

[The essay not to exceed a folio page.]

GEOMETRY.

Euclid, Books 1 *and* 2.

1. If one side of a triangle be produced, the exterior angle is greater than either of the interior opposite angles.

2. To describe a triangle, the sides of which shall be respectively equal to three given straight lines.

Show where in the construction it is assumed that any two of the lines must be greater than the third.

3. If the square described on one side of a triangle be equal to the squares described on the other two sides, the angle contained by those sides is a right angle.

4. In an obtuse angled triangle, if a perpendicular be drawn from either of the acute angles to the opposite side produced, the square of the side opposite the obtuse angle is greater than the squares of the two sides containing it, by twice the rectangle contained by the side upon which when produced the perpendicular falls, and the line intercepted without the triangle between the perpendicular and the obtuse angle.

5. To describe a square which shall be equal to a given rectilineal figure.

Euclid, Book 3.

1. The diameter is the greatest straight line in a circle, and of all others that which is nearer to the centre is greater than one more remote; and conversely.

2. If a straight line touches a circle, the perpendicular to the touching line from the point of contact passes through the centre; and conversely, the line drawn from the centre to the point of contact is perpendicular to the touching line.

3. The angle in a semicircle is a right angle, and the angle in a segment less than a semicircle is greater than a right angle.

LATIN.

I.

Translate:—

Una illa sublevanda offensio est, ut et utilitas in amicitia, et fides retineatur; nam et monendi amici sæpe sunt, et objurgandi: et hæc accipienda amice, cum benevole fiunt. Sed nescio quomodo verum est, quod in Andria familiaris meus dicit:

Obsequium amicos, veritas odium parit.

Molesta veritas, si quidem ex ea nascitur odium; quod est venenum amicitiæ: sed obsequium multo molestius, quod peccatis indulgens, præcipitem amicum ferri sinit; maxima autem culpa in eo est, qui et veritatem aspernatur, et in fraudem obsequio impellitur. Omni igitur hac in re habenda ratio et diligentia est: primum, ut monitio acerbitate, deinde objurgatio contumelia careat: in obsequio autem (quoniam Terentiano verbo lubenter utimur) comitas adsit: assentatio, vitiorum adjutrix, procul amoveatur: quae non modo amico, sed ne libero quidem digna est; aliter enim cum tyranno, aliter cum amico vivitur.

Parse *monendi*. Parse *amice*,—compare it. Parse *parit*,—decline its perfect indicative. What does *pareo* mean? conjugate it. What is the derivation of the English word "parent?" Parse *ferri*. What case is *contumelia*, and why? Parse *adsit*,—compound *sum* with *potis*, *pro*, *de*, *ab*, and conjugate these verbs. Parse *adjutrix*,—give its derivation.

Numerical value, 50.

II.

Auream quisquis mediocritatem
Diligit, tutus caret obsoleti
Sordibus tecti, caret invidenda
Sobrius aula.

Saepius ventis agitatur ingens
Pinus; et celsae graviore casu
Decidunt turres; feriuntque summos
Fulgura montes.

Sperat infestis, metuit secundis,
Alteram sortem bene praeparatum
Pectus. Informes hiemes reducit
Jupiter; idem

Submovet. Non, si male nunc, et olim
Sic erit: quondam cithara tacentem
Suscitat musam, neque semper arcum
Tendit Apollo.

Parse *diligo*, conjugate it; conjugate also "*deligo*." What gender is *pinus*? Compare *ingens*. What word is understood after *infestis* and *secundis*? What is the difference in meaning between *alter* and *alius*? Decline *pectus*. Compare *male*. Decline *arcum*.

Numerical value, 50.

III.—*Passage from an unprescribed Author.*

His constitutis rebus, nactus idoneam ad navigandum tempestatem, tertia fere vigilia solvit, equitesque in ulteriorem portum progredi, et naves conscendere, et se sequi, jussit: a quibus quum id paullo tardius esset administratum, ipse hora diei circiter IV cum primus navibus Brittaniam attigit; atque ibi in omnibus collibus expositas hostium copias armatas conspexit. Cujus loci haec erat natura: adeo montibus angustis mare continebatur, uti ex locis superioribus in littus telum adjici posset.

Parse *nactus*, *progredi*, *conscendere*, *attigit*, *conspexit*. Decline *littus*.

Numerical value, 50.

IV.—*Passage to be rendered in correct Latin.*

The sick man had been ordered by his physician to take the prescribed physic; but he forgot to do so, and his malady so increased that his life was in peril.	Aeger a medicus suus medicina praescribo capio jubeo; ille autem ita facio obliviscor, et morbus sic cresco, ut vita in periculum esse.

Numerical value, 50.

In order to pass, the candidate must do one or other, but not both, of Passages I. and II.; he must also do Passages III. and IV.; and have obtained 100 marks in all.

SECOND DAY.—COMPULSORY.

ARITHMETIC.

1. Reduce 14 tons, 15 cwts. 3 qrs. 11 lbs. 13 oz. to ounces and thence to grains.

2. By what number must £401, 11s. 9½d. be multiplied so as to produce £17268, 7s. 0½d.?

3. If 47 pieces of cloth, ¾ of a yard wide, cost £23, 10s., what will 27 pieces of the same length, a yard wide, cost at the same rate?

4. Add together $\frac{1}{11}$, $\frac{1}{31}$, $\frac{1}{34}$, $\frac{3}{56}$, and $\frac{4}{77}$, expressing the result as a fraction in its lowest terms.

5. Find the interest on £1407, 10s. for 121 days at 4¼ per cent.

6. A person's clear income after paying 5 per cent. on the gross income for the expense of collecting was £902, 10s.; required the gross income.

7. Reduce 14s. 7½d. to the decimal of a guinea; and multiply the result by ·0028.

8. A person transfers his capital from the 3½ per cents. at 77 to the 4 per cents. at 89; find the increase or decrease per cent. in his income.

N.B.—The working of each question, as well as the answer, must be given in full.

ALGEBRA.

1. Multiply $4-2x+7x^2$ by $7-2x+4x^2$. Find the numerical value of the result when $x=-1$.

2. Extract the square root of $25x^4 - 6xy(5x^2 + 4y^2) + 49x^2y^2 + 16y^4$.

3. Reduce to single fractions in their lowest terms:—

(1.) $\dfrac{2x}{x^2-y^2} + \dfrac{1}{x+y} - \dfrac{1}{x-y}$.

(2.) $1 - \dfrac{2x}{x+1} + \dfrac{x^2}{(x+1)^2}$.

4. Write down the sum of—

$(a+b+c)^2 + (a+b-c)^2 + (a+c-b)^2 + (-a+b+c)^2$.

5. Solve the following equations:—

(1.) $\frac{2}{5}x + \frac{1}{3}(x-2) = 2x - 7$.

(2.) $\dfrac{1}{(x-1)(x-2)} = \dfrac{3}{(2x-3)(x-4)}$.

6. In 1874 A's age is 40, B's 32; find the date at which A's age was double of B's.

7. Prove the rule for finding the greatest common measure of two numbers.

N.B.—The working of each question, as well as the answer, must be given in full.

SECOND DAY.—OPTIONAL.

GREEK.

Translate:—

I. (*Homer, Ilias, Lib. II.*)

Ὣς ἄρα φωνήσας ἀπεβήσατο· τὸν δ' ἔλιπ' αὐτοῦ
Τὰ φρονέοντ' ἀνὰ θυμὸν, ἅ ῥ' οὐ τελέεσθαι ἔμελλε·
Φῆ γὰρ ὅγ' αἱρήσειν Πριάμου πόλιν ἤματι κείνῳ,
Νήπιος· οὐδὲ τὰ ᾔδη ἅ ῥα Ζεὺς μήδετο ἔργα.
Θήσειν γὰρ ἔτ' ἔμελλεν ἐπ' ἄλγεά τε στοναχάς τε
Τρωσί τε καὶ Δαναοῖσι διὰ κρατερὰς ὑσμίνας.
Ἔγρετο δ' ἐξ ὕπνου. θείη δέ μιν ἀμφέχυτ' ὀμφή·
Ἕζετο δ' ὀρθωθεὶς· μαλακὸν δ' ἔνδυνε χιτῶνα,
Καλὸν, νηγάτεον· περὶ δ' αὖ μέγα βάλλετο φᾶρος·
Ποσσὶ δ' ὑπαὶ λιπαροῖσιν ἐδήσατο καλὰ πέδιλα·
Ἀμφὶ δ' ἄῤ ὤμοισιν βάλετο ξίφος ἀργυρόηλον·
Εἵλετο δὲ σκῆπτρον πατρώϊον ἄφθιτον αἰεὶ,
Σὺν τῷ ἔβη κατὰ νῆας Ἀχαιῶν χαλκοχιτώνων.

Parse *φωνήσας*,—whence is it derived? Parse *ἀπεβήσατο*. Decline *ἤματι*. Parse *θήσειν*. Compare *μαλακὸν*. Parse *Ποσσί*. Parse *εἵλετο*.—Numerical value, 50.

Translate:—

II. (*Herodotus, Book I.*)

Ὁ μὲν ταῦτα ἔλεγε. Κῦρος δὲ αὐτὸν λύσας κάτισέ τε ἐγγὺς ἑωυτοῦ, καὶ κάρτα ἐν πολλῇ προμηθίῃ εἶχε, ἀπεθώμαζέ τε ὁρέων καὶ αὐτὸς, καὶ οἱπερὶ ἐκεῖνον ἐόντες πάντες. ὁ δὲ συννοίῃ ἐχόμενος, ἥσυχος ἦν. μετὰ δὲ, ἐπιστραφεὶς τε καὶ ἰδόμενος τοὺς Πέρσας τὸ τῶν Λυδῶν ἄστυ κεραΐζοντας, εἶπε· "Ὦ βασιλεῦ, κότερον λέγειν πρὸς σὲ τὰ νοέων τυγχάνω, ἢ σιγᾶν ἐν τῷ παρεόντι χρή;" Κῦρος δέ μιν θαρσέοντα ἐκέλευε λέγειν ὅ τι βούλοιτο. ὁ δέ αὐτὸν εἰρώτα, λέγων· "Οὗτος ὁ πολλὸς ὅμιλος τί ταῦτα σπουδῇ πολλῇ ἐργάζεται;" Ὁ δὲ εἶπε· "Πόλιν τε τὴν σὴν διαρπάζει καὶ χρήματα τὰ δὰ διαφορέει." Κροῖσος δὲ ἀμείβετο· "Οὔτε πόλιν τὴν ἐμὴν, οὔτε χρήματα τὰ ἐμὰ διαρπάζει· οὐδὲν γὰρ ἐμοὶ ἔτι τούτων μέτα. ἀλλὰ φέρουσί τε καὶ ἄγουσι τὰ σά."

Parse *ἐγγῦς*,—compare it. Parse *ἐπιστραφεὶς*. Parse *σιγᾶν*. Parse *εἰρώτα*. Decline *πολις*,—give the English words derived from it.—Numerical value, 50.

III.

Derive from the Greek the following words used in the English language:—Theocracy, Demagogue, Aristocracy, Oligarchy, Anarchy, Theatre, Polygonal, Zoophyte, Neophyte, Eucharist, Metamorphosis, Polynesia, Tetrarch, Anachronism, Barometer, Euthanasia, Hydrometer.—Numerical value, 50.

[To pass, the candidate must have obtained in all 100 marks.]

FRENCH.

1. Translate into English:—

Mais la trompette sonne: ils s'élancent tous deux;
Ils commencent enfin ce combat dangereux.
Tout ce qu'ont pu jamais la valeur et l'adresse,
L'ardeur, la fermeté, la force, la souplesse,
Parut des deux côtés en ce choc éclatant.
Cent coups étaient portés et parés à l'instant.
Tantôt avec fureur l'un d'eux se précipite;
L'autre d'un pas léger se détourne, et l'évite;
Tantôt, plus rapprochés, ils semblent se saisir;
Leur péril renaissant donne un affreux plaisir;

On se plaît à les voir s'observer et se craindre,
Avancer, s'arrêter, se mesurer, s'atteindre :
Le fer étincelant, avec art détourné,
Par de feints mouvements trompe l'œil étonné.
Telle on voit du soleil la lumière éclatante
Briser ses traits de feu dans l'onde transparente,
Et, se rompant encor par des chemins divers,
De ce cristal mouvant repasser dans les airs.

2. Parse *ont pu ; parut ; On se plaît à les voir*,—conjugating the verbs.

3. Correct the errors in the following phrases :—*Ma mère a ecrite une lettre ; Lucrèce s'est tué ; Ces hommes prevoyants le danger.*

4. Translate into French :—

I profited so well by the instructions they gave me, that at the end of five or six years, I understood the Greek authors a little, and the Latin poets pretty well.

GERMAN.

1. Translate into English :—

Wie? Was liegt
Dem guten Menschen naher als die Seinen?
Gibt's schönre Pflichten für ein edles Herz,
Als ein Bertheidiger der Unschuld sein
Das Recht des Unterdrückten zu beschirmen?
—Die Seele blutet mir um euer Volk,
Ich leide mit ihm, denn ich muss es lieben,
Das so beschieden ist und doch voll Kraft;
Es zieht mein ganzes Herz mich zu ihm hin,
Mit jedem Tage lern' ich's mehr verehren.
—Ihr aber, den Natur und Ritterpflicht
Ihm zum geborenen Beschützer gaben,
Und der's verlässt, der treulos übertritt
Zum Feind und Ketten schmiedet seinem Land,
Ihr seid's, der mich verletzt und kränkt; ich muss
Mein Herz bezwingen, dass ich euch nicht hasse.

2. Parse the following phrases, conjugating the verbs :—*Was liegt dem guten Menschen näher ; Die Seele blutet mir ; Lern' ich's mehr verehren.*

3. Translate into German :—

Frederick von Schiller was born at Marbach on the 10th November 1759. He studied the sciences at Stuttgart. He wrote a historical work, as well as many poems and plays. He died at Weimar in 1805.

NATURAL PHILOSOPHY.

1. State the characteristic differences between solids, liquids, and gases. What are the laws which connect the volume of a gas with its density and temperature respectively?

2. A weight of 3 lbs. is supported by two weights of 2 lbs. each, by means of strings which pass over pulleys placed 18 inches apart, in the same horizontal line. Required the distance below this line at which the weight rests.

3. Enunciate the first law of motion, and give arguments in support of it. What is meant by a uniformly accelerating force? Show how the force of gravity may be measured by means of Attwood's machine.

4. Define specific gravity. If the average specific gravity of a man be the same as that of water; how many cubic feet does a man of 14 stone measure, given that a cubic foot of water weighs 1000 oz. av.?

5. Explain the action of the siphon. How does this action account for the phenomena of intermitting springs?

6. Give a drawing and description of Bramah's press.

Part Third.

PERISCOPE.

COCCOBACTERIA SEPTICA.

In order to place before our readers an account of the observations and opinions recorded by Billroth, in his large work on the Coccobacteria Septica,[1] we give the following literal translation of the abstract of the book by Senator in Nos. 29, 30, and 31 of the Centralblatt of the current year.

The smallest elements of those organisms which are found universally in putrefying liquids, those round or oval bodies which oscillate in thin media, which other authors call *Monades*, *Micrococcen*, *Microsphären*, and *Microsporen*, Billroth calls "Coccos." The most minute species, *Micrococcos*, are always found in putrefying blood; the middle-sized, *Mesococcos*, as a rule in not very old acid milky serum; the largest, *Megacoccos*, are plentiful during the first 24 to 48 hours in concentrated "flesh-water;" but these latter Billroth is only acquainted with in a state of rest. One of these three species always preponderates in each kind of fluid. If air is introduced, every coccos develops a slimy veil round itself on the surface of the fluid, through which each separate globule blends with the others and forms first a smooth surface (Petalococcos), and then irregular balls (Gliacoccos). If air is excluded, the Gliacoccos organizes itself but sparingly, and what is already developed falls into a weakly cohering flaky mud. Solution of iodine and iodide of potassium colours the coccos light yellow; mesococcos from milk, yellowish red; in the uniting slime (Glia), acetic acid, liquor potassæ, and alcohol bring about no change; iodine, aniline, madder, and ammoniacal solution of carmine do not colour it at all.

The coccos increases by means of transverse cleavage after a previous elongation, which occurrence Billroth has twice directly observed. Certain appearances seem also to point to a longitudinal cleavage. The small forms never grow into independent larger ones, but grow only to divide, whilst the larger ones frequently fall to pieces and become smaller ones. From want of oxygen, from the addition of common salt or saltpetre, or from unknown causes, coccos dilate.

With the Petalococcos are not to be confused certain delicate, colourless amorphous pellicles, which appear beside it in many fluids, but which never grow and never fall to pieces, which furthermore contain individual coccos, and which are perhaps inorganic.

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[1] Th. Billroth, Researches in regard to the Vegetable Organism of Coccobacteria Septica, and their connexion with the Origin and Increase of Wounds. Berlin, Reimer, 1874.

In fluids not in a state of motion (beside the Gliacoccos) there are formed, through division in one direction, chains (Streptococcos) of different lengths, more or less twisted, each link of which divides itself again, and so can assist the growth of the chain; the links hang together by means of the (invisible) slime. When air was withdrawn the plasma came out of the globules as an amorphous granular substance.

The skin upon the surface of many putrefying fluids (flesh-water) shows when carefully manipulated and slightly magnified grayish-green knotty or cylindrical figures, full of micrococcos, which are held together by a very glutinous glia. These globules Billroth saw now and then suddenly burst open in a certain spot and empty out the micrococcos, whereupon the globular mass drew itself together and folded, so that it appeared to be made of a membrane. In many preparations this appearance could be seen directly, and it was of a variable thickness. This "Ascococcos," a coccos inside a tube, is regularly emptied through the orifices in the tube.

The Bacteria, by which Billroth designates only really rod-shaped organisms, occur as micro-, meso-, and mega-bacteria, the first of which can only be recognised by Hartnack's system No. 15, and can scarcely be distinguished from the Diplococcos. The two larger forms very generally appear arranged together in a double manner (Diplobact.). A Glia also unites bacteria (Petalobact.), but the formation of a mass, as in the case of the Ascococcos, never occurs in the larger ones, but seldom in the smaller ones, sufficiently accounted for by the lively motion of each individual bacterium. The propagation of bacteria occurs sometimes through transverse furrowing and tearing of the covering glia, but sometimes from certain permanent spores (*Dauersporen*) of Gliacoccos by a process of outgrowing. The conditions requisite for this kind of growth and for the existence of micro-, meso-, or mega-bacteria differ according to the nourishing fluid, ventilation, etc. Through continued growth lengthways and a transverse furrowing the streptobacteria take their origin, the links of which hang together for a shorter or longer time, and finally tear themselves away and begin to move, that is when in a thin medium. The longer the chain the slower in general is its movement. At 60° C. the motions of bacteria ceased entirely, and after five hours they did not return at the ordinary temperature of the room, if even later is doubtful. Ciliary movements could not be observed even by the most different stainings of the bacteria. By complete exclusion of air the smaller forms of mono-, diplo-, and strepto-bacteria alone develop, which soon become colourless and fall to pieces. In the megabacterium chains from the pericardial serum Billroth saw the granular plasma disappear from some of the chains and leave behind apparently empty husks, BUT IT IS STILL MORE CUSTOMARY TO SEE THE BACTERIA FALL TO PIECES, AND THEN TO GLOBULES, AT FIRST SHUT UP IN THE GLIA CAPSULE (AS ASCOCOCCOS) AND AFTERWARDS FREE. A third change is the appearance of darkly-contoured fat-glistening drops at one end of the body of the bacterium, through which it assumes a nail-like appearance (Helobacteria), and does not further develop; besides this the appearance of colourless swellings and partial dilatations of one or of many links of a bacterium chain, and at last, especially after the addition of certain salts (nitrate of potash), appear sharp detachments of the weakly trembling chain. Billroth comes to the conclusion that all the already-described forms belong to one vegetable species, the coccobacteria septica, especially because he succeeded in finding in long-preserved milk-serum coccos, ascococcos, and bacteria combined to form one vegetable growth. A further development of the coccobac. sept. Billroth has never observed, even when by transplantation to fresh nourishment-material all possibility of exhaustion of the conditions of life could be avoided.

COMPLETELY-DRIED COCCOBACTERIA, in whatever stage of development, could not in a great many cases be restored to life by the addition of any fluid whatsoever—that is, could not be made capable of development. On the other hand, it was shown to be beyond doubt that in the atmosphere (of the laboratory in the Vienna hospital) germs of coccobact. sept. (*Dauersporen*) are present, which developed luxuriously in flesh-water kept for half an hour previously at a temperature of 200°C. These *Dauersporen* were able to bear water at the boiling and at the freezing point (although Billroth, on the following page, 33, states supplementarily that they can be annihilated by simple boiling). They can be thoroughly dried and then reconstruct themselves in a medium sufficiently rich in water into micrococcos, which surrounds itself with glia, and then develops itself again into chains, or through stretching of the individuals into bacteria.

Billroth (contrary to Karsten and J. Lüders) denies that there is a generic relationship of coccobacteria with penicillium, and the ferment of beer and fruit-juice, in so far as the one could be said to be produced by the other. As a rule, the elements of coccobacteria do not flourish where luxuriant yeast vegetation exists, only oidium lactis can flourish beside it.

Pericardial fluid taken 14-60 hours (in summer) after death showed itself in 113 out of 200 cadavera free from organisms; in the others bacteria of a moderate size and very large streptobacteria, and beside them sometimes also micrococcos were found; but the latter were only found in about a fourth of the cadavera. In two-thirds of all cases in which organisms were found, acute diseases were the cause of death, only in one-third chronic. By no process of cultivation was it possible to obtain from the large organisms (streptobacteria gigas pericardii) anything else than the disappearance of the plasma or the appearance of dark fat glistening globes inside it, which Billroth designates as "Dauersporen."

In the blood of the cadavera of human beings who had died of septic diseases (ersyipelas, pyæmia, septicæmia) coccobacteria were by no means invariably found; also experiments on dogs, which had been killed in different ways, and had lain for different lengths of time in cooler or warmer temperatures, showed that the degree of corruption must be considered to be the most important test for the presence of these organisms. Pus taken out of closed cavities in cadavera showed an equally varying state of things: in four cases in the cerebrospinal fluid, bacteria were only manifest in one, in which it was polluted by the blood of an already thoroughly putrefied cadaver. All vegetable forms immediately after being taken out of the cadaver were at rest, but made movements on the addition of water.

Many experiments with INFUSIONS OF THE MOST DIVERSE SPECIES OF FLESH AND ORGANS, WITH BLOOD, AND WITH LYMPH (taken from a human fistula) AND PUS, demonstrated that the three last mentioned fluids took longer to putrefy than the former ones, and only develop the smaller forms of coccos and bacteria. From the many individual facts cited in the original, we bring into prominence that flesh-water in all degrees of putrefaction had an alkaline reaction even when it smelled sour or cheesy or of sulphuretted hydrogen. In milk and in sweet whey, the bacteria flourished long after the period of turning sour—differing in many ways from those present in other fluids. Beside coccobacteria, oidium also became luxuriantly developed (see above), and later penicillium also. On the other hand, these two flourish well, as well as aspergillus in putrefying urine, in which coccobacteria, chiefly meso- and strepto-bact., as well as micro- and meso-coccos, appear beside the chains. The "Torula urinæ" is the intermediary streptococcos.

ALL THESE ORGANISMS CAN FOR DAYS AND WEEKS LONG BE FOUND IN URINE, BEFORE IT REACTS IN AN ALKALINE MANNER. Sweat seems, according to one isolated experiment, to be no favourable soil for the development of coccobacteria, just as little the mixed saliva and fat from the human cadaver; on the other hand, the human bile seems more favourable. In fresh uncooked and also cooked white of egg, only a partial development of distorted forms were found; on the other hand, in an infusion of hard-boiled egg-yolk larger ones. Concerning the properties of certain exudations, see the original.

Experiments on the PATHOLOGICAL SECRETIONS OF LIVING HUMAN BEINGS showed that evil-smelling and rank pus from wounds contains chiefly micrococcos, the quantity of which stands in no proportion to the texture of the tissue; that bad smell and the prominence of micrococcos in pus do not of themselves necessitate fever; that in pus of completely closed-up abscess cavities vacuolated coccos forms can occur, and that such pus can stink without containing coccos; that individuals with closed-up suppurations can be in a state of high fever without the pus or the inflamed tissue being putrid in the ordinary sense of the word, and without their containing vegetable forms. The sero-purulent contents of erysipelas pustules contained in five out of ten cases no elements of coccobacteria; on the other hand, the contents of the skin bullæ contained them twice out of thirteen times. In the secretions of gangrenous and diphtheritic ulcerations constant micrococcos and microbacteria were discovered as well as short detachments of them.

CULTURE-EXPERIMENTS ON ALL ORGANISMS FOUND IN THE ABOVE-MENTIONED CIRCUMSTANCES GAVE ALWAYS, ACCORDING TO THE NATURE OF THE FOSTERING SOIL, DIFFERENT FORMS OF COCCOBACTERIA, BUT NEVER SUCH AS DISTINGUISHED THEMSELVES FROM THE VEGETABLE FORMS WHICH OCCUR IN PUTREFACTION OUTSIDE THE ORGANISM. This, and the similarity of the appearance of certain forms with those of organisms observed in different diseases, leads to the conclusion that as yet no morphological characteristics denote any micrococcos or bacteria formation, from which it can be decided that such can only be developed in a certain disease or in a living body.

If to boiled Pasteur's fluid (for composition see Cbl. 1873, 116), or to Cohn's fluid (water 100, acetate of ammonia 1, magnes. sulph. and calcii chlorat. 0·03, and potass. phosph. 0·04), quantities from different putrefying fluids are added, and for several days kept at the temperature of the body, the vegetable formations of the coccobacteria mostly disappeared; at all events, there was no observable distinct further development, and new formations did not arise. Atmospheric contact seemed to be important for their thriving, so that frequently vegetation only formed on the fluid surfaces. Vegetations which disappeared in one mixture developed in another, and *vice versa*. The most powerful in vitality seemed to be the vegetation formed by putrid urine and flesh-water. Fresh, normal, strongly-acid urine, which had, without anything being added to it, remained acid for thirteen days, upon the addition of a very little putrid urine, or as much putrid alkaline flesh-water, became alkaline in one day; on the contrary, after the addition of other putrid alkaline or sour fluids, not until after many days, and indeed weeks. Filtered hydrocele fluid was clear for a long or a short time, according to the nature of the fluid that was added. Just as different was the behaviour of urine, filtered hydrocele fluid, and pus, when dried putrid fluids or pathological secretions (with or without vegetation) on strips of linen were added. For instance, urine did not become alkaline until two days after the addition of dried, fresh, odourless pus, without vegetable forms, five days after that of putrid urine, and much longer after other substances that were added. On the whole, these and other experiments showed that the further development of coccobacteria from fluids and atmospheric air cannot take place under all circumstances, but is bound up with many and somewhat complicated conditions, and that the previous decompositions necessary to make fluids putrefy do not necessarily have any connexion with the organisms, nor relationship with their development.

Turning to the production of coccobacteria among LIVING

HUMAN BEINGS, Billroth next infers, that for its development it requires much water, and must stagnate on the substratum upon which the chemical changes are to act for some time under unchanging circumstances. These conditions are scarcely met with in healthy, and not always in sick people, with regard to parts of the body in direct communication with the outer world; for even from the parts sufficiently saturated with water, the germs are as a rule removed by the currents of air outwards or the flow of secretions. Wherever a stagnation takes place, as, for instance, in the mouth between the teeth (in normal circumstances at least), the living cellular action of the epithelium of the mucous membrane, and that of the underlying tissue, opposes the development of these elements. That germs can reach the blood-stream, for example, through the lungs, is not improbable, but they vegetate here no further, at least in a healthy condition, as has been shown by experiments on dogs with injection of putrid fluids (compare M. Wolff, Cbl. 1873, 114, ff.). Thus, according to Billroth, observations on the production of bacteria in the blood of healthy or sick people can be called in question, and still less can these be considered as obviously connected with septic diseases; especially, Billroth found in the septicemic and the pyæmic in the blood of the cadaver, when distinct putrefaction had not set in, only exceptionally micrococcen; much oftener in the pericardial serum (see above), where they could have penetrated from the intestine. Even in inflammation of the spleen the bacteria are as yet not pointed out with sufficient perspicuity as the only cause of the inflammation.

A certain *vital influence*, through which the development of putrefaction and of bacteria is hindered, must be attributed to many closed-up pus, serum, or blood collections, which remain for a long time in the body without decomposing. THE COCCOBACTERIAN SPORES ARE NOT ABLE TO ASSIMILATE ALBUMEN IN THE FORM IN WHICH IT IS FOUND IN THE LIVING ORGANISM.

Every kind of pus is not a favourable soil for micrococcos, but it is made so by a special kind of acute inflammation, namely, that of connective tissue (erysipelas, diphtheritic phlegmons), whereby, according to Billroth, a substance resembling a ferment ("phlogistisches zymoid") is added to the pus from the inflamed tissue. By means of this the pus is altered, the coccos flourishes luxuriantly in it, and it now brings about other alterations. The coccos does not require to come immediately from the air to reach the prepared pus, but can reach it through the juices of the body, in proof of which many observations can be cited. The pus of a wound or a cavity can also, through the inflammation of the surrounding tissue, be decomposed and fitted for the growth of coccos, being infected by other pus already decomposed and containing micrococcos. The phlogistic zymoid is formed by each acute inflammation in greater or less intensity and quantity, and spreads the process of inflammation to the tissues with which it comes in contact in a concentrated form.

To its presence, and not to that of micrococcos, the inflammatory effect of pus is due, which, at the same time, does not require to be decomposed, nor in any way to betray its infectious quality. As an example of peculiar specially infectious kinds of inflammation, Billroth selects "DIPHTHERIA," as being characteristic of the deposit of a strongly fibrinous coagulating exudation in the tissues. The strongly infectious property of the secretion cannot be considered as a characteristic criterion, for every acute inflammation yields a secretion able to infect at a certain stage. In diphtheritic inflammation this stage lasts a long time, chiefly because the zymoid partly fixed in the coagulation is not set free until late; when the circulation becomes again free, it becomes eliminated with the suppurative softening and necrosis of the tissues.

[But this does not explain the SPECIFIC action of the diphtheritic secretion—namely, its peculiarity of again producing DIPHTHERIAL inflammation. The Abstractor (Senator) takes the liberty here of referring to his forthcoming essay on "CYNANCHE CONTAGIOSA," in Volkmann's Collection.]

Billroth, in accordance with his observations, cannot believe that the micrococcos which is found in diphtherial tissue is primary, and precedes the inflammatory changes. Further, the acceptance of a micrococcos, which lies at the foundation of the miasmatic and contagious qualities of diphtheria, has no special advantages. (Compare Senator, Cbl. 1873, 75.) Just as little does it seem necessary to consider micrococci in urinous diphtheria, in similarly described processes in wounds of the buccal cavity, designated by Billroth Muco-salivary Diphtheria, and in the phagedenic gangrene (hospital gangrene), as causes of the destruction of tissue. Billroth especially directs attention to the fact, that in all these deep fibrinous infiltrations by microscopic observation extensive micrococci vegetations can easily be simulated. In erysipelas, organisms are not invariably found in the blood and serum; the extension of these in certain anatomical directions (Cbl. 1872, 241) is also explained by an unorganized inflammatory ferment; it is similar with LYMPHANGITIS. In PHLEBITIS which has taken place after wounds and acute inflammation, and which almost always begins as periphlebitis, THROMBOSIS only appears under most favourable circumstances, for which the coccobacteria must not be made answerable.

As concerns the PUTRID INFECTION, the fact that coccos vegetations cannot always be proved in the blood, proves nothing by itself. Many experiments prove that infection is the consequence of a body working like a ferment; others again declare that the action is not brought about as in fermentations proper, by infinitely small quantities of the poison, but stands in direct relationship to the quantity of putrid fluid introduced. Billroth inclines to the idea that the putrid poison is directly applied to the organism in a way analogous to poisonous chemicals, and that it does not work by fermentation on the blood first, in order to produce the deleterious matter. It then works as the phlogistic zymoid in certain concentrations, produces phlegmons in many tissues and organs, and probably the chemical changes in the parenchyma of the acutely inflamed tissues are analogous to those in putrid tissues. If thence follows a certain etiological connexion between fever caused by wounds, septicemia, and pyæmia, nevertheless there are distinct CLINICAL types belonging to each of these diseases which differ from each other essentially, probably because the infection is not always regular—as, for example, in pyæmia—but occurs in separate attacks. The zymoid infectious substance can be fixed by coccobacteria, and can be carried further by them, but whether it can exist without them in fluids or dry matters cannot be determined.

In the last section, Billroth busies himself with the changes which certain added substances produce on the development of coccobacteria, and with the therapeutic import of the anti-putrid substances. Sugar added to all kinds of animal secretions, and to the fluids of the tissues, hindered the development of the bad smells caused by decomposition, and when plentifully added also impeded vegetative growth. CARBONATE OF POTASH, SULPHATES OF COPPER AND IRON, BORACIC ACID, ACETATE OF AMMONIA (of each about 1 to 30 water), MULLER'S FLUID, LIQ. PLUMBI, CARBOLIC ACID, (1 to 10 and 20 water), BUTYRIC ACID (4 drops to 1 ounce of flesh-water), and LACTIC ACID (in the same manner, and added to 1 ounce of solution of sugar), equally well hinder the coccos development; whereas DILUTED ALCOHOL, CHLORINE WATER (1 to 20 water), CHLORATE OF POTASH, COMMON SALT, SALTPETRE, CARBONATE OF SODA and CARBONATE OF MAGNESIA, CHALK, SODIUM, SULPHATE OF MAGNESIA, PHOSPHATE OF POTASH and SODA, ACETATE OF POTASH (all these salts in the proportion of 1 to 30), finally PERMANGANATE OF POTASH (1 to 48), only slightly or not at all hindered the development. In already COMMENCED PUTREFACTION with rich coccos vegetation, the stink could be prevented by the plentiful addition of SUGAR, or of juices and fruits (figs) containing much sugar, probably because the sugar favours the development of yeast (chiefly oidium), which prevents that of coccobacteria. Milk, yeast, onions, radishes had not this effect. Destruction of the bacteria and removal of the stench followed invariably when solutions of CARBOLIC ACID (1 ounce to 1 pound, with some alcohol added, to make the solution complete), PERMANGANATE OF POTASH (1 to 24), SUBLIMATE (1 to 320), CHLORIDE OF GOLD (1 to 200), NITRATE OF SILVER (1 to 24), QUININE (1 to 48), extr. spir. LIGNI CAMPECHIANI (1 to 24), or TINCTURE OF IODINE, LIQUOR FERRI SESQUICHLOR., PYROLIGNEOUS ETHER, WOOD VINEGAR, WINE VINEGAR, LIQU. POTAS. CAUST., LIQU. AMMON. CAUST., LACTIC ACID, GLYCERINE, AQUA CREOSOTI, were mixed in equal parts with liquid putrefactive matter, whereas far greater quantities of LIQ. PLUMBI, RECTIFIED ALCOHOL, CHLORINE WATER, and CHLORIDE OF LIME are necessary to obtain the same end.

In relation to therapeutics, Billroth discusses the conditions for the favourable and unfavourable progress of wounds; that is to say, of subcutaneous wounds, wounds produced by caustics, wounds hermetically sealed, and without dressings ("open-wound treatment"), by means of immersion and irrigation, and wounds in cavities. Further, of the purification and renewal of air, the disinfection of walls, utensils, and bandages, and, in short, of a great many more or less important antiseptic remedies.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

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[The author of these Reports will be glad to receive any books, pamphlets, or papers relating to Materia Medica or Therapeutics. They may be forwarded through the agencies of the *Edinburgh Medical Journal.*]

THE INFLUENCE OF ETHYL-ALCOHOL ON THE BODILY TEMPERATURE, THE PULSE, AND THE RESPIRATIONS OF A HEALTHY MAN.—The following conclusions are deducible from the experiments of Dr Parkes, communicated to the Royal Society, 12th Feb. The temperature is probably slightly lessened. The pulse-rate is increased at first, but subsequently lowered; when the effect of the alcohol had passed off, the heart's beats were less frequent than natural. Respiration seemed to be slightly lessened.

The following are the results of Riegel's experiments, which are detailed in the *Deutsches Archiv für Klinische Medicin*, vol. xii. parts 1 and 2:—Alcohol depresses the temperature to a few tenths of a degree (C.) for a short time. The depression is less, or even absent, in the case of those recovering from severe illness, or those who are accustomed to the use of alcohol. The degree of depression is proportionate to the dose. Alcohol, like tea or coffee, decidedly diminishes bodily waste.

THE PHYSIOLOGICAL ACTION OF ALCOHOL.—The following is an abstract of the results arrived at by J. Dogiel (see *Pflüger's Archiv*, vol. viii. parts 11 and 12, and *London Medical Record*, April 29):—

Ethyl-alcohol, when introduced into the stomach, is absorbed by the veins and lacteals. It acts chiefly, not through reduction in the blood, not through the oxidation-products of alcohol in the blood, but as alcohol. The action of alcohol on the blood differs according to the concentration and quantity of the alcohol, and according to the duration of its action and the temperature. The crystallization of hæmoglobin under the influence of alcohol does not depend on the action of oxygen. Blood from an animal under the influence of alcohol coagulates more slowly, and yields less fibrin than normal blood. Alcohol causes the amœboid movements of the white corpuscles to cease, and at a certain concentration dissolves both them and the red ones. Alcohol added to arterial blood retards putrefaction; but arterial blood from an intoxicated animal decomposes more quickly than normal blood. The acceleration of the heart's action by alcohol is followed by a retardation. The arterial blood-pressure is at first increased and then diminished by alcohol. The rapidity of the blood-current in the carotid is at first increased and then diminished. Respiration is accelerated by small doses of alcohol, but rendered slow by large ones. Alcohol causes lowering of the bodily temperature. Reflex movements, the excitability of motor and sensory nerves, and the power of muscular contraction, are at first increased and then diminished by alcohol. The quantity of chyle from the thoracic duct, and the amount of secretion of the gastric juice, are at first increased and then diminished. The quantity of the urine, and the secretion of saliva from the submaxillary gland are increased. The action of ethyl-alcohol on the nervous system is direct, and not caused by changes of the blood or of the circulation.

Methyl-, propyl-, butyl-, and amyl-alcohols act similarly to ethyl-alcohol, but differ from each other in the intensity of their action. The difference in the intensity of the action of the monatomic saturated alcohols stands in intimate relation to the difference in their composition. Thus, methyl-alcohol acts less intensely than ethyl-alcohol, whilst propyl-, butyl-, and amyl-alcohols act in the ascending scale much more strongly.

PHYSIOLOGICAL ANTAGONISM OF POISONOUS SUBSTANCES.—Dr Alex. B. MacDowall gives, in the *London Medical Record*, 22d April, a summary of the conclusions arrived at by Martin-Damourette and others. Eserine, the active principle of Calabar bean, excites the muscles and produces muscular contractions; it excites the cerebro-spinal motor centres, and diminishes the excitability of the nerve-terminations in the muscles. These effects depend on the dose and mode of administration. A large dose will produce convulsions, paralysis of the phrenic nerves, and death by asphyxia; while divided doses will destroy muscular contractility without producing the nervous excitation. We can establish a tolerance of doses which are more than toxical, and which are capable of relaxing tetanized muscles—hence the use of Calabar bean in tetanus. Atropine in small doses has neuro-paralytic properties, capable of arresting the convulsive action of eserine. M. Martin-Damourette is of opinion that eserine causes contraction of the pupil by a direct action on the constrictor muscle. According to M. Köhler, the antagonism of Calabar bean and of atropine only exists in warm-blooded animals. The same is true of the antagonism between saponine and Calabar bean.

ATROPINE HYPODERMICALLY IN TRAUMATIC TETANUS.—Dr Miller records a successful case, *Phil. Med. and Surg. Reporter*, 21st March. Hydrate of chloral was administered, and $\frac{1}{60}$th gr. of sulphate of atropia was given hypodermically twice daily for four weeks. The pulse-rate was from 112 to 120.

TREATMENT OF TRAUMATIC TETANUS BY CHLORAL.—Dr Coryllos (*Allgemeine Wiener Mediz. Zeitung*, 27th Jan.) reports two cases successfully treated after removal of a foreign body from the wounds. Chloral, to the extent of from a drachm and a half to two drachms daily, had been administered. In one case, 3½ ounces had been given in the course of twenty days; and in the other case, which extended over a longer period, 6 ounces of chloral in all had been given. M. Chauvel also records two cases, *Progrès Méd.*, 2d May. He gave the chloral in doses averaging 37 grammes in twenty-four hours. In neither case were the symptoms relieved, and both patients died. M. Verneuil was more successful in the treatment of two cases, details of which were communicated by him to the *Société de Chirurgie de Paris.* He gave a drachm and a half of chloral in the twenty-four hours in one case, and two drachms and a half in the other. Both cases were cured. Although M. Verneuil does not condemn M. Oré's plan of intravenous injection of chloral, he would not begin the treatment of a case of tetanus in this way; he has now cured five cases of tetanus by chloral administered by the mouth.

Dr A. von Huttenbrenner (*Jahrbuch für Kinderheilkunde*, vol. vii.) thinks that chloral is preferable to all other remedies in the treatment of trismus neonatorum. He gives it in one or two grain doses, dissolved in the mother's breast-milk, and carefully poured through the child's nose. He repeats the dose with each paroxysm until the child passes into a calm sleep.

ANÆSTHESIA BY INTRAVENOUS INJECTION OF CHLORAL.—M. Oré (*Soc. de Chirurgie de Paris*) advocates intravenous injection of chloral as a means of producing anæsthesia in tenanus, etc. He condemns the hypodermic administration of chloral hydrate as being useless if the dose be too small, and as giving rise to abscesses if the dose be sufficiently large as to act therapeutically. Three injections of ten grammes every twenty-four hours for three days has determined sleep, complete paralysis of sensibility, and of motor power. M. Oré is of opinion that anæsthesia produced by intravenous injection of chloral is applicable to surgical operations of long duration, such as resections and ovariotomies, etc.

RADICAL CURE OF VARIX BY INJECTION OF CHLORAL HYDRATE.—A summary of the observations of Professor Porta and Dr Valerani is given by Dr A. Henry in the *London Medical Record*, 4th March. Professor Porta reports fifteen cases of varix of the leg treated successfully by subcutaneous injection of chloral, beginning with a gramme, and then reducing the dose to a half or a third of a gramme. For details we refer to Professor Porta's paper, *Gazetta*

delle Cliniche, No. 1, 1874, and Dr Valerani's communication in the *Annali Universali di Medicina* for December 1873, or to Dr Henry's report.

CHLORAL IN THE TREATMENT OF INCIPIENT ABORTION.—Dr Besnier, in *L'Union Med.*, 27th Sept. 1873, records a case of incipient abortion successfully treated by the use of chloral hydrate. An enema of 45 grains was administered. Almost immediately labour pains ceased, and the patient slept for three hours. A second and third enema, each of 30 grains, were subsequently given, and 12 to 15 drop doses of tincture of opium were then given every two or three hours. The case was in every way successful. Dr Besnier thinks that, in abortion, the anæsthetic action of the chloral suppresses the pains, which are the cause of the uterine contractions. If the fœtus or placenta were engaged in the os uteri, the chloral would be ineffectual. Dr Besnier is in accord with Bernard, Guibert. Joujon, and Labbé in thinking that the anodyne effects of opium and chloral are increased by their combination. Besnier is an advocate of the theory, that chloral acts by becoming converted into chloroform by the alkaline salts of the blood—a view which, we think, is untenable, both on chemical and physiological grounds, as so well demonstrated by Gamgee (*Pharm. Jl. and Trans.*, 2d series, vol. ii.)

THE PHYSIOLOGICAL ACTION OF CHLORAL.—M. Byasson thinks that the longer duration of the action of chloral compared with that of chloroform is due to the slowness of the chemical action, and that the difference in the physiological phenomena is explained by the intervention of formic acid, produced at the same time as the chloroform, and acting under special conditions.—*Acad. des Sci.*, 2d March. M. Personne made a communication on this subject to the *Acad. des Sci.*, 12th Jan. He is of opinion that the combination of the chloral with albumen explains the longer duration of action of this body compared with chloroform. The first action of chloral on the albumenoid materials of the economy produces chloroform at the expense of their alkali; at the same time, these materials, deprived of their alkali, contract a combination with the undestroyed chloral, and this combination is, in some sort, a reservoir of chloroform. Thus is explained why it is we meet with so small a quantity of chloroform in the blood of animals submitted to the action of chloral. The theory that the action of chloral is in part to be accounted for on the supposition that formic acid is produced, and is subsequently reduced into carbonic acid in the system, M. Personne has endeavoured to disprove experimentally. He gave formic acid to dogs without perceiving the slightest production of carbonic acid, nor did any symptoms of anæsthesia supervene.

DEEP INJECTION OF CHLOROFORM IN TIC DOULOUREUX.—The case was under the care of Dr J. B. Mattison of Chester, New Jersey.—One-third of a drachm of chloroform was injected near the infraorbital foramen. The patient was placed on good general tonics, and a hypodermic injection of $\frac{1}{48}$th grain of sulphate of strychnia, with $\frac{1}{60}$th grain of sulphate of atropia, was administered three times daily for some time. In a few weeks the health was entirely restored.—*London Medical Record*, 10th June.

CAMPHORATED PHENOL.—Dr A. Henry reports, in the *London Medical Record*, 4th Feb., on Bufalini's conclusions as to the therapeutic uses of camphorated phenol. It produces the same effects as, but is less dangerous than, and is not attended with the disadvantages of, carbolic acid. It may be used both externally and internally. It modifies unhealthy wounds, and destroys the parasites which are present in certain diseases, as septicæmia and typhoid fevers, etc. Bufalini describes two methods of preparing the compound.

THE TREATMENT OF GLYCOSURIA WITH CARBOLIC ACID.—Drs Ebstein and Müller contribute an interesting paper on this subject to the *Berliner Klinische Wochenschrift* for December 1873. They suggest that abnormal fermentation may, in many cases, cause or permit the occurrence of glycosuria. They consider that carbolic acid may thus be useful in checking the formation of the fermenting principles, and they prefer carbolic acid to creasote, as being more definite in composition, and in being tolerated in much larger doses. Two cases are recorded in which the most marked benefit resulted from the treatment—the sugar disappearing from the urine while the patients were taking the carbolic acid. A third case is however mentioned, in which the carbolic-acid treatment was unavailing. The following is the author's formula:—A gramme of crystallized carbolic acid in 25 grammes of distilled water, and 50 grammes of peppermint water. Six or seven tablespoonfuls of this are given daily.

PARENCHYMATOUS INJECTIONS OF CARBOLIC ACID.—Hüter has employed this method of treatment with success in arthritis of the knee, in subacute adenitis, and in traumatic erysipelas, etc. He asserts that it immediately relieves the pain, and quells the local fever.—*Centralblatt*, 24th Jan.

TREATMENT OF ERYSIPELAS BY SUBCUTANEOUS INJECTION OF CARBOLIC ACID.—Dr Aufrecht practised injections of carbolic acid in doses of 0·60 centigrammes in ten cases. Not only were the erysipelatous swelling and redness rapidly dissipated, but the temperature, pulse, and general health were remarkably improved.—*Centralblatt*, 21st Feb.

SULPHATE OF CADMIUM IN ACUTE URETHRAL BLENNORRHAGIA.—Dr Gazeau prefers this agent as an injection to sulphate of zinc; its astringent action being more energetic and persistent. In chronic blennorrhagia of some years' duration, the sulphate of cadmium is useless.—*London Medical Record*, 10th June.

CONDURANGO IN THE TREATMENT OF CANCER.—Prof. N. Friedreich, in the *Berliner Klinische Wochenschrift*, 25th Jan., details a case which he diagnosed as cancer of the stomach, and which he treated successfully by condurango. Four drachms of condurango bark were macerated for twelve hours in twelve ounces of distilled water, and then boiled down to six ounces, and strained. Of this mixture a tablespoonful was given twice daily.

THE ACTION OF EUCALYPTUS.—The investigations of Theodor Siegen as to the action of eucalyptus are summarized by Dr T. Lauder Brunton, in the *London Medical Record*, 4th Feb. Eucalyptol, according to Siegen, exerts quite as powerful an antiseptic action as quinine. It hinders alcoholic fermentation, and depresses the temperature of the body more than quinine. Eucalyptol, like quinine, hinders oxidation in protoplasm. Siegen considers that eucalyptol in large doses is of great use in the treatment of febrile diseases of respiratory organs, especially hooping-cough. In several cases it acted as an anthelmintic.

Dr E. Burdel does not appear to think so highly of this drug. (*Bull Gen. de Thér.* 30th Dec. and *Revue des Sci. Med.* April 1874.) He considers that, as a febrifuge, it is slow and inconstant in its action; and in the treatment of ague he finds it in every respect inferior to quinine.

THE ACTION OF ETHEREAL OILS.—Grisar, under the direction of Prof. Binz, has experimented with oil of valerian, oil of chamomile, oil of eucalyptus, camphor, and oil of cummin. All these oils diminish reflex excitability in frogs; camphor acting most powerfully and persistently; and then the oils of valerian, chamomile, eucalyptus, and cummin in the order named. A stage of excitement precedes the depression. Small doses have a stimulating action only. The depression of reflex excitability is caused by direct action on the cord, and not by stimulation of the inhibitory centres in the brain. The oils of valerian and of eucalyptus, and probably those of chamomile and cummin, act on warm-blooded animals as they do on frogs; camphor, on the contrary, produces convulsions in warm-blooded animals. "A good example of the connexion between physiological action and chemical constitution is afforded by camphor and oil of cummin or cymol. The formula of the former is $C_{10}H_{16}O$; that of the latter is $C_{10}H_{14}$, differing from the other only by the elements of water H_2O. Equal doses of the two preparations were given to two rabbits of the same size. That which received the camphor urinated frequently, and died in convulsions, while that treated with cymol presented no abnormal symptoms.—Dr T. Lauder Brunton in *Medical Record*, 4th Feb.

THE THERAPEUTIC ACTION OF GELSEMINUM.—Dr W. C. Hull of Monroeton, Pennsylvania, communicates an interesting paper on this subject to the *Philadelphia Medical Reporter*. According to this author gelseminum acts directly on the great sympathetic, diminishing the amount of nervous force transmitted through the vasomotor system of nerves to the capillary vessels, impairing their tonicity, and producing congestion. Gelseminum is not an arterial sedative, as veratrum viride is. The latter drug is adapted to the treatment of congestive and inflammatory diseases; for, by directly restraining the heart's action, less blood is forced into the weakened and distended capillaries, and resolution is facilitated. On the other hand, gelseminum is contraindicated in such conditions, as it indirectly restrains the heart's action, by first producing general capillary congestion: a morbid state which generally aggravates existing local lesions. The following are the conclusions at which the author has arrived regarding the use of gelseminum:—

1. It is not adapted to the treatment of inflammatory and congestive diseases.
2. It inflicts positive injury in active congestion.
3. Its therapeutic scope does not extend much beyond certain simple forms of fever.
4. In order to obtain its specific action in fever, it must be rapidly introduced into the system, until its characteristic effects are produced on the organs of vision.
5. It can be given in full doses with entire safety in those cases to which it is adapted.

The affections in which Dr Hull has found this drug to be most beneficial are the bilious, catarrhal, and the gastric fevers of childhood. In typho-malarial fever, when there is a marked predominance of the malarial character, it often aborts it. The usual dose was five drops of the fluid extract every two hours, according to the effect.

Dr J. D. M'Gaughy of Wallingford, Connecticut, writing to the *Philadelphia Medical Times*, 7th March, relative to the use of gelseminum in intermittent fever, says, "I feel pretty well assured that if physicians will give gelseminum a fair trial in connexion with quinine, in cases where quinine *alone* has failed to cure, they will meet with gratifying success, provided they push the gelseminum until its physiological effects are produced."

KOUMISS.—Dr V. A. Jagielski has two articles on koumiss in the *British Medical Journal*, 4th February and 7th March. Cow's milk is a better raw material than mare's milk for making koumiss, as it is free from any disagreeable odour and taste, and the composition and consistence of the koumiss produced can easily be varied. The various sorts of koumiss used in Great Britain are, "full," "medium," "whey," "bland," and "diabetic koumiss." For particulars as to the characters and composition of these, we refer to Dr Jagielski's papers. Koumiss is an easily-digestible nourishment, and a pleasant dietetic remedy. It rapidly improves digestion and nourishment, and is well suited to heal the relaxed condition of the mucous membrane. It is in fact applicable in nearly every disease in which the strength and nutrition are reduced.

PERMANGANATE OF POTASS IN OXALURIA.—Dr Thorne of Chicago thus writes (*Michigan Medical University Journal*):—When we consider the fact that uric acid may disappear entirely from the urine, and that oxalic acid is not normally present, is it not fair to conclude that the uric acid must, in the normal condition of things, undergo decomposition in the body? We find that by adding an excess of permanganate of potass to uric acid out of the body, it is directly converted into urea and carbonic acid; and that when the oxidation is less complete, it passes into the form of urea, oxalic acid, and carbonic acid. If, therefore, we would prevent the formation of uric acid and oxalic acid, we must supply the seven equivalents of oxygen and four of water. This is most conveniently done in the form of permanganate of potass:—

℞ Permanganate of potass, . . grs. viii.
Water, ... ℥ij. M.

One teaspoonful to be given three times a day.

It should not be given except on an empty stomach; for in contact with organic matter, it is decomposed, yielding its oxygen to any element, simple or compound, that will receive it. I have repeatedly directed during the last two years the permanganate to be given as above in oxaluria, with the most happy result.

FOURNIER ON SYPHILITIC GUMMATA.—Gummata are described under various names (subcutaneous tubercles, nodes, apostemata dura, ganglions, tophi). They may be defined thus:—*Nodular and circumscribed tumours, at first solid and non-inflammatory, they soften very slowly, ulcerate by an inflammatory action in the surrounding parts, and discharge a very characteristic, whitish, purulent material, somewhat resembling sloughed flesh.*

These gummata consist of solid tumours of variable size, of a rounded or flattened form, situated in the subcutaneous cellular tissue. The tumours are not contained in a cyst, and are only limited by cellular tissue condensed on their periphery. In the early stage, these tumours are formed of tissue, sometimes uniformly gray and semi-transparent, at other times grayish-red with or without rather opaque grayish striæ. They are at this time tolerably firm and dense, and their consistence may be compared to liver slightly indurated. Later, the tumours change their appearance, and become more opaque and whiter. In a still more advanced stage they become quite white, yellowish-white, or even almost yellow. They are at this time like tubercle. At a still more advanced period of the second stage they begin, usually at the centre, to soften. The characters presented by the softened material are very various; at one time it is a yellowish, opaque, pretty thick fluid, like pus, but, as we shall see afterwards, not pus;

at another time it is a yellowish-brown, viscid filamentous fluid resembling a thick solution of gelatine or gum. In this manner the gumma begins by being entirely solid; later on, it undergoes degeneration and breaking up of its elements.

What the microscope reveals is:—1st, Gummy tumours do not consist, as was formerly believed, of a simple liquid exudation. They are always, on the contrary, organized and constituted of well-defined morphological elements. 2d, These growths, notwithstanding the specific cause which gave them birth, have no special anatomical element. What is found with them is also found in morbid growths having no specific origin. This absence of special anatomical element is all that can be said of their actual histology. 3d, Gummata are constituted solely of a proliferation of connective tissue. From this purely anatomical point of view, they differ in no way from other growths, which, clinically and nosographically, are known to be different. The gummy tumour is constituted simply as follows:—*A*. A very accessory portion of cellular tissue forming scarcely one tenth of the whole tumour. *B*. Cells of various dimensions forming seven or eight tenths of the whole mass. *C*. An amorphous intercellular stratum, finely granular. *D*. A few vessels. Such are the characters of a gumma in process of formation.

4th, This structure of the gumma is, however, not permanent, it is destined to a rapid fatty degeneration. The cells become small and are transformed into fatty granules, which compose the yellowish tubercular-like masses. Afterwards, the gumma either degenerates into dry, cheesy, tubercular-looking masses, or softens.

The clinical history of the gumma divides itself into four periods. 1st, Period of formation (gumma increasing, solid, non-inflammatory); 2d, Period of softening with consecutive inflammation of the vicinity; 3d, Period of ulceration; 4th, Period of reparation.

I. PERIOD OF FORMATION (*gumma increasing, solid, non-inflammatory*).—The cellular tissue gumma commences as a small subcutaneous nodule. This nodule, very small at first, like a lead pellet or a pea, gradually increases to the size of an olive or a small nut. It then increases more slowly to the size of a nut, a small egg, or even as large as a hen's egg.

The following are the characteristics of the gumma at this period, —1st, It is distinctly defined, neither incorporated with the skin nor the subjacent tissues. 2d, In form, this tumour is generally globular ovoid. It resembles an olive, or more nearly a ganglion. 4th, Finally, this tumour is essentially non-inflammatory; it enlarges very slowly.

2d PERIOD.—*Softening, with consecutive inflammation of the vicinity.* To the solid gumma succeeds, after a certain lapse of time, the softened gumma, and it is this work of softening which constitutes the second stage. At first the gumma is firm, consistent, manifestly solid. A time comes when this consistency diminishes; the gumma becomes less firm under the touch; the hard sensation which the tissue furnished gives place to a sensation of flabbiness, and finally fluctuation is perceived.

This softening of the gumma commences at the centre of the tumour. But before long, to this central phenomenon is added, an inflammatory action of the more superficial parts on a level with the integument. The tissues become red and inflamed, analogous, for example, to those which cover a subcutaneous adenitis approaching suppuration. At the same time, the patient feels a certain amount of tension and uneasiness. The tumour is less mobile, and the reddened integument becomes progressively thinner. Finally, the cutaneous pellicle ruptures, and the stage of ulceration begins. Such is the second stage of the existence of gummata. The pathological phenomena are, to sum up,—1st, Progressive softening of the tumour from the centre to the periphery, with no elevation of temperature, pain, or inflammatory phenomena. 2d, More slowly, peripheral inflammatory phenomena, resulting in ulceration of the integuments on the surface of the tumour, and producing an outlet.—(*To be continued.*)

CHLORAL FOR ANATOMICAL INJECTIONS.—Dr Keen, Lecturer on Anatomy, Philadelphia, has lately published an account of some interesting experiments, in which he injected bodies for anatomical purposes with a solution of chloral; the strength varying from five to sixty grains of the hydrate of chloral to the ounce of water. The following may be taken as an example:—"A negro died in the city, 18th February, and lay exposed during the warm weather we had then till 28th February, when he was brought to my rooms. The cuticle was off over all the chest, which was green and crepitant, and the legs were dropsical. Though a large man, I tried the chloral, on 28th February, gr. xv. to ℥j. 12th March—*i.e.*, twelve days after injection, and twenty-two days after death—the subject is perfectly preserved. The cuticle elsewhere is adherent, the chest is natural in colour, the smell is gone, and the specimen of muscular tissue, taken from the abdominal walls, is of admirable colour and consistence." Dr Keen seems to think that five grains of chloral to the ounce of water will yet prove of sufficient strength for anatomical injections. He is not aware what effect the hot weather of summer may have on subjects injected with a solution of chloral, but he claims for it entire superiority in the winter time for all dissections, and especially for the finer and more delicate ones of the skilled anatomist.

Part Fourth.

MEDICAL NEWS.

Japanese Medical Journal.—The second number of Kin-Si I-Setzu, or Modern Medical News, a bi-monthly medical journal in the Japanese language, has just been sent us. It is the first medical journal published in Japan, at Yedo, by the imperial government, and it has a guaranteed circulation of one thousand copies. It is edited by Stuart Eldridge, M.D. (U.S.). The first number contains:—1. Lectures on Urethral Stricture, by Editor, Lect. 1. 2. Surgery without Hæmorrhage (Esmarch's method). 3. Apparatus for Digital Dislocations. 4. Government Inspection of Coal Oil. 5. On the Relief of Pain. 6. Necessity for the Education of Midwives in Japan. 7. The Salts of Copper in Cholera. 8. The Nitrite of Amyl, a New Remedy for Asthma. 9. Rules for the Administration of Arsenic. 10. Oxide of Zinc in Diarrhœa of Infants. 11. Tincture Ferri Chloridi in Smallpox. 12. Gelatine Suppositories in Fæcal Accumulation. 13. Treatment of Syphilitic Onychia. 14. Tincture Ferri Chloridi in Post-partum Hæmorrhage. 15. Ergotine in Hæmorrhage, etc.

Dr Francis Edmund Anstie, editor of the *Practitioner*, and physician to the Westminster Hospital, died in London on Saturday the 12th of August, after a very short illness; the immediate cause of death being blood-poisoning from a wound of the finger received in opening a child who had died of peritonitis. Exposure to sewer-gas poison may have predisposed the system to the reception of the poison.

Though only forty-one years of age, Dr Anstie had impressed the profession and the public by his strong good sense, his literary power, and his untiring industry, and, had he been spared, would probably have taken a very high position as a consulting physician. He has left few equals in the department of medical literature.

Dr Samuel Somerville of Ampherlaw died suddenly in his house in Hart Street, on the morning of the 12th of September. By his death the College of Physicians loses a most faithful and valued official, as he had been treasurer to the College for a considerable period. The medical profession will miss one who maintained a consistent position as a kind-hearted, honourable gentleman of the old school, and many friends will have very tender reminiscences of a warm-hearted, hospitable, and witty companion.

His death, caused by the rupture of an aortic aneurism, was very sudden, and apparently without a struggle. His remains were laid in his family vault at Carnwarth on the 18th, and were followed to the grave by many of his medical friends.

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ORIGINAL COMMUNICATIONS.

ARTICLE I.—*The Morisonian Lectures, delivered before the Royal College of Physicians of Edinburgh: Session* 1874. By J. BATTY TUKE, F.R.C.P.E., F.R.S.E.

LECTURE I. (*delivered 17th March.*)

MR PRESIDENT,—My first duty is to thank the Patron of the Morisonian Lectureship for the honour he has conferred on me in appointing me to deliver prelections on the subject of Insanity. I beg to assure him and the Fellows of this College that, as far as my light goes, I will endeavour to carry out the wishes and intentions of the Founder.

The study of the multiform conditions comprised under the general term Insanity has been approached by the former lecturers in this College from three different positions. That well-beloved physician, William Sellar, was naturally led, by the character of his studies and the inclination of his mind, to regard the subject from the metaphysical standpoint. Dr Arthur Mitchell[1] brought to bear upon the subject his widely-extended means of observation, his extensive literary researches, and his acknowledged powers of generalization, concentration, and criticism. Were it not for our official relationship, I would wish to dilate more fully on the great service which Dr Mitchell's lectures have effected in widening our views on the nature of insanity in all its relations, medical, social, and legal. In David Skae, my much-beloved and respected master, you had a representative psychiatric clinicist. In the posthumous lectures delivered last year by Dr Clouston (a most delicate task, performed in a spirit of extreme conscientiousness), a system of classification was submitted to you, founded mainly on clinical observation. However we may regard the principle on which this system was based, or the weight of argument adduced to substantiate it, we must acknowledge that it was one of the markings in the epoch of alienistic medicine, in which its study was being raised from the indefinite basis of pseudo-metaphysical generalization and landed on the firmer platform of scientific observation. Skae's principles led to the notation of psychical symptoms as indicative of somatic conditions, and in so doing, to accurate observation and the collation of pathogeny, etiology, and pathology. Its author did not advance it as a perfect system, he only regarded it as a schema of observation which would tend towards the establishment of a storehouse of facts, from which future workers might obtain definite data.

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[1] One of Her Majesty's Commissioners in Lunacy for Scotland.

On undertaking the duty of preparing this course of lectures, I felt how difficult was the task before me; as I was to address an audience of men practically acquainted with the treatment of insanity, and whose long clinical practice would render it impertinent in me to submit the results of my comparatively limited experience merely for their criticism or comment; for, believe me, Gentlemen, I am fully cognisant of the fact that it is the non-alienistic physician and the general practitioner who see and treat insanity in its most important stages. The only advantage we asylum physicians have, is, that we are forced to direct our attention almost exclusively to particular points and aspects of mental disease, little cognisance of which is taken in systematic books on the practice of physic, compelling us to concentrate our energies in a manner which the exigencies of practice render all but impossible for a member of the general medical public to do.

Keeping this in view, I deliberated long and anxiously whether the present state of our knowledge was such as to warrant an attempt to approach the subject by the avenue of general pathology, and more especially of morbid anatomy. The track appeared so faint, so many apparent difficulties lay in the way, at certain points it became lost in the broad moor of hypothesis; on the other hand, so many converging lanes seemed to lead towards it, such an amount of the traffic of argument, so many toilers at varying intervals were plodding along it, hardening and consolidating the path, as to justify at least an effort to establish pathology and morbid anatomy as the highway to the study of so-called mental disease. Whether the attempt is too ambitious must be left to your verdict;—to my mind its very difficulty warrants the undertaking. In many points of detail I know success is impossible, but on the main principles involved some light may be thrown.

Allow me shortly to point out the preliminary difficulty I have encountered. It is the general non-acceptance of the pathological fact that insanity is an indication of *disease of the brain.* It is only within a comparatively few years that insanity has in theory been admitted to be a symptom of bodily disease. It is true that most writers on the subject have pointed out that psychical disturbances occur along with certain conditions of the general system, but without exception they have magnified the symptom *to the detriment of the efficient cause.* The prominence given to the consideration of the psychical symptom has been such that the symptom has obtruded itself upon the mind of the observer to such a degree, that it has assumed the position of the disease,—a disease, however, which has been ascribed more to perversion of mental function than to somatic changes, and a condition therefore to be studied by the light of abstract psychology. Thus, every book on insanity which has ever been published commences with an analysis of the Psyche, and the invariable result has been that this preliminary study has so worked upon the authors that when they have arrived at the practical part of their work, the physiology and pathology, which had been interwoven with their psychology, have failed to assert themselves in any substantial form, and the classification of so-called mental disease has assumed the shape of arbitrary catalogues of perversions of function framed in accordance with the tone of the writer's mind. I will only instance the brilliant work of Maudsley, in which a strong foundation of physiology is built up, but which foundation is kicked down by the author himself when he treats of the varieties of insanity as a practical physician. He assigns reasons of the most urgent character for regarding insanity as a disease of the brain; yet when he proceeds to nosology, he reverts to psychology, and lays down two great classes, affective or pathetic insanity, and ideational insanity. Further on in this or the next course, I shall have to revert to the principles of classification; I only allude to this particular instance to show how strong the tendency is to regard the symptom in preference to the efficient morbid cause.

There is no stronger evidence of this tendency than can be gained by examination of the British official nosology; for in the work which stands, and has stood since its publication, on the book-shelf of every member of the profession in Great Britain and Ireland—a work compiled by a joint-committee appointed by the Royal College of Physicians of London, and issued by the authority of the Registrar-General—there will be found a list of some nine hundred diseases, a large assortment of poisons, and fifty-seven pages of accidents and malformations under which the body of the Briton is authorized to suffer or die; the mind of the Briton, however, is authorized to suffer from only six "disorders of the intellect;" the idea of somatic disease as associated with insanity being studiously ignored. On what principle the differentiation between a disease and a disorder is founded, or on what pathological principle it is based, it is difficult to say; still, there the opinion stands, expressed by very high authority, that insanity is not a disease of the body, merely a disorder of the intellect.

Far be it from me to underrate the value of the study of psychology in connexion with the study of insanity; the two cannot be disassociated. I only deprecate as a practical physician its study as a primary study, for it is quite subservient to pathology, general and morbid. Skae put it well when he defined insanity to be "a disease of the brain *with mental symptoms.*" This is the light by which we all regard mental disease in practice. The time has gone by when any apology is needed for treating the subject from a pathological and consequently anatomical and physiological point of view; the everyday work of the physician brings with it evidences of the subjection of the mental faculties to material conditions, and the whole tenor of modern research is towards the localization of nervous function, and consequently to definite localization of morbid conditions.

But as pathologists how are we to regard the brain functions? Every now and then the coarsely material apothegm of Cabanis has cropped up on the surface of metaphysical and psychological discussion, that mental manifestations are as much secretions of the brain as bile is of the liver. I do not propose to dwell long on this question, for it possesses no anatomical or physiological ground of support. The cells of the brain are doubtless dependent on blood-supply for the exercise of their vital properties, in the same way as the cells of the liver; but here the analogy begins and ends, for in no way can the results of brain organization and action be claimed as a secretion. It is not that they are immaterial and impalpable, which renders inapplicable to them the term secretion; it is that the force generated in the brain controls the results of the organization and action of the glands, and that without it they would be powerless and inoperative. We admit that the brain is dependent on material conditions for the exercise of its function, but on the exercise of certain of these functions depends the permanent exercise of the function of every structure of the body. It is the organ of the body in which is generated a something which in our ignorance we call a force, which, whether we view it as vitalists or physicists, is very closely associated with the phenomena of life. We are about to direct our attention more especially to the physical causes of the abnormalities of the phenomena of ideation, emotion, and volition, although we shall find that with them are intimately associated perversions of the other phenomena of nerve force, sensation, motion, and nutrition. It is utterly opposed to all the ideas of the *mens medica* that an insane mind can exist in a sane body; there is no analogy in any other system; and the fact that the moral and intellectual faculties are not the only ones implicated, that the disease which evidences itself by perversion of mental function is invariably attended by changes in the general system, affords strong and valuable support to the general theory of the corporeal nature of insanity. Doubtless there are many questions apparently involved which do not admit of pathological explanation; I only propose, however, to treat of those conditions which I believe are susceptible of it. The extraordinary epidemics of enthusiasm and emotionalism of the dark ages and of the present day do not come within the pale of my subject; for, as a physician, I have nothing to do with the influence the orator exerts on his audience, whether he speaks from the platform or the pulpit, until the emotions he excites stimulate brain action beyond the confines of health in the

individual. Until the patient is before us we have no *locus standi.* This may be a narrow view of the position, but it is the one which must be taken by the physician, and until taken up by him, the lunatic must remain on the border-land of medicine, neither quite accepted nor entirely extruded. It is for us to determine whether he is a metaphysical curiosity or a pathological entity.

I am inclined to elaborate Skae's definition, by saying that *insanity consists in morbid conditions of the brain, the results of defective formation or altered nutrition of its substance, induced by local or general morbid processes, and characterized especially by non-development, obliteration, impairment, or perversion of one or more of its psychical functions.*

This definition is so broad as to include many forms of insanity which do not properly belong to my province; I will therefore fence my lectures by stating that the arbitrary line which exists between the temporary insanities characterized by delirium, coma, or convulsions, and the more permanent forms characterized by mania, delusion or dementia, will be, as far as possible, studiously adhered to, *without prejudice, however, to the opinion that they in fact form one inseparable whole.* As the lecturer on surgery must at times touch slightly on the field of the teacher of medicine, and *vice versa,* so must I, if a broad view of the subject is to be taken, occasionally overstep the arbitrary boundary which exists between general and psychiatric medicine.

Adopting this definition as the proposition to be proved, we will proceed to its demonstration by what appears to me a logical sequence. We will consider,—

1st. The Normal Histology of the Brain.

2d. The more recent Advances in Cerebral Physiology.

3d. The Influences inducing and producing Brain Diseases, with the Associated Symptoms.

4th. The Nature of the Lesions found in the Brains of the Insane.

I. *The Normal Histology of the Brain.*

The study of the pathology of the brain was for long retarded by the imperfection of our knowledge of the finer points of its anatomy. It is within comparatively recent times that methods of investigation have been devised by which the intimate relationships of its delicate structures could be viewed under the microscope. This difficulty was overcome by the discovery that its tissues could be submitted to the hardening influence of chemical agents—such as chromic acid, chloride of gold, iodized alcohol, and others—which, whilst rendering them amenable to the section knife, did not produce any material change in their constituent elements. Immediately on this method of research becoming known, a crowd of workers took up the subject of the microscopic anatomy of the brain; on the Continent, this new field attracted numerous investigators, whilst in this country Lockhart Clarke has rendered his name historical from the bright light his labours have thrown on the histological anatomy of the brain and spinal cord.

The statement that no material change in the cerebral tissues results from their subjection to hardening agency, must, of course, be made with reserve. It is not contended that they present the identical appearance of the living structure; that is impossible in any dead tissue, and more especially in those, the soft nature of which renders it impracticable to cut thin sections in the fresh state; it is only contended that the modification is so slight as to render the demonstration reliable, in so far as that the relation of constituents is not materially interfered with, and that no artificial structures are produced.

As succinctly as possible I will endeavour to lay before you the more recently elucidated points of normal cerebral anatomy. We will consider, first, the several constituents separately, and then their relations one to the other. This step is absolutely necessary in order to give weight to any demonstrations of morbid appearances which it may be in my power to submit to you; and further, it is advisable to collect as far as possible the various facts scattered throughout separate monographs in various languages, or buried in the not very accessible Transactions of the Royal Society of London. Those who are specially acquainted with the subject must bear with me, for I am sure it is no disparagement to the anatomical lore of the mass of my hearers to presuppose that they are not closely conversant with the details of that department of the science which appears to have but slight bearing on general medicine. Nor would I enter on these details, were it not that I hope to give you ocular demonstration of morbid appearances in each and all of the cerebral structures in insane brains.

What I desire most particularly to direct your attention to, is the histological anatomy of the convolutions, that portion of the brain in which we believe, with good reason, exist the structures through whose action the higher functions are manifested, and consequently through the diseases of which insanity is manifested.

The histological components of the brain are:—

1. Nerve fibres.
2. Nerve cells.
3. Bloodvessels.
4. Lymph spaces and canals.
5. Interstitial matter.
6. The cerebro-spinal fluid.

Nerve Fibres.

There are three great systems of fibres in the cortical substance and the immediately subjacent white matter. The first consists of nerve fibres continuous with the peduncular fibres of the spinal cord, which, after passing through the pons and crura cerebri to the optic thalami and corpora striata, radiate outwards to the cortical substance, where, breaking up into bundles, they form what Meynert terms the "projection system." The second consists of certain bundles of fibres which run parallel to the plane of the convolution, and consequently at right angles to the divergent or radiating fibres, forming the first link of Meynert's "association system;" and, third, the commissural fibres, forming the second link.

When we view by a low power a section of a healthy convolution cut transversely to its length, we see the fibres arranged in a fan or fountain-like manner, springing from the central white stem, and diverging outwards to the periphery. As it makes its way from within outwards, each fibre becomes finer and finer; this attenuation has been ascribed by certain authors to dichotomous subdivision, and by others to the giving off of fibres to the horizontal layers. The former opinion is untenable; the latter is open to grave doubt. I am inclined to agree with Cleland that each fibre maintains an individual continuity, and that it terminates, on reaching the outermost layer, by projecting itself horizontally into the superficial structures.

You are all acquainted with the appearance of striation presented to the naked eye on section of the gray matter, *i.e.*, that it is divided into alternating layers of darker or lighter colour. This appearance is due to a system of horizontal fibres which traverse the length of the cortical substance, and to the presence or absence of cells and nuclei in the several layers. The demonstration of these horizontal fibres is much more difficult than that of the divergent, and, unluckily, specimens showing them do not maintain the demonstration for any length of time, in consequence of chemical changes in the necessary hardening agent; and it is perhaps in consequence of this that considerable difference of opinion exists as to their exact anatomy. Lockhart Clarke describes the fibres of the central white stem as, in addition to the radiating fibres, throwing off others which "curve inwards from opposite sides to form arches along with some of the gray layers." This he calls the "arciform system" of fibres. Cleland differs from this opinion; he holds that the horizontal fibres are entirely independent, "that the vertical and horizontal fibres cross one another with the utmost clearness, and without the slightest tendency to pass one into the other." From close examination of a large number of sections, it appears to me that the horizontal fibres immediately external to the gray matter are not derived as described by Clarke, and that those in the actual substance of the cortex hold no immediate connexion with the radiating bundles. It must be remembered that Cleland is most distinct and definite in his opinion expressed in 1860, and that his opinion has not been assailed by Clarke. He is moreover sustained by Arndt to some degree, and Gerlach's observations may be read as favourable. By study of the diagrams of Cleland

and Arndt[1] you will gather that there is more than one band of horizontal fibres, that in addition to various individual fibres there are at least three broad striæ—an inner, traversing the convolution where the gray matter meets the white; a middle, thin, in the actual cortical substance; and an outer separating or rather inter-current between the layers containing the largest cells. Outside, there are a few fibres following the course of some of the external layers.[2] From whatever source these fibres may be derived, it is evident that an associating system exists, by which the convolutions maintain very intimate connexions.

Time will not serve for close inquiry into the arrangement of the third great system of cerebral nerve fibres—the commissural fibres of the corpus callosum—I will only remind you that "by them the corresponding and identical regions of the cortex of the two opposite cerebral hemispheres are united" (Meynert).

In the convolutions nerve fibre is reduced to its smallest dimensions. When taken from a recently-killed animal, it presents itself as a simple tube, but shortly after death, or after the application of water, it shows a double contour (Bennett). Certain histologists consider that this is simply a post-mortem appearance, and that during life the nerve fibre or tube consists of a simple sheath or neurilemma containing a homogeneous plasm. But as all post-mortem appearances must result from some variety of structure during life, it can hardly be contended that the manifest differences between the contents of the neurilemma, or primitive sheath, as disclosed by the microscope after death, are entirely artificial. These are doubtless due to coagulation; but the fact that they coagulate in different manners shows that they are of different consistence and different structure. It is reduced almost to demonstration that in life nerve fibre is of a semi-fluid consistence, but this is true of many other structures, muscle for instance; still no one will presume to say that the striation and non-striation of the two kinds of muscle is a mere post-mortem appearance. The fact that we have varieties presented by nerve fibre—I allude to the medullated fibre of the cerebro-spinal axis and the non-medullated fibre of the sympathetic system—shows that the differentiation is not alone caused by post-mortem changes, but by actual structural difference, and of this we have further confirmation by the variety of behaviour of the contents of the neurilemma under chemical agency.

As I have said, the nerve fibre consists of a primitive sheath or neurilemma. This invests two materials or structures, the presence of which causes the appearance of a double contour when the fibre is viewed either in its long or short axis. The outer line is the primitive sheath, the two inner lines the axis cylinder of Purkinje. Between the sheath and the axis cylinder there exists a substance, oleo-albuminous in its chemical composition, to which is due the

[1] Schultz's Archives of Microscopic Anatomy, 1867, vol. iii. p. 476.

[2] Bucknill and Tuke's Psychological Medicine, p. 613.

white appearance of nerve fibre; this is the white substance of Schwann. It can be easily seen to ooze out of the torn end of a fibre (Bennett). And it has a strong tendency to assume special forms. It is not colourable by any known chemical agent, in which it differs from the sheaths and the structure it surrounds, viz., the axis cylinder. In recent specimens this axis cylinder presents itself as a gray streak in the length of the fibre; when subjected to colouring agents, as a strongly-tinted band. When speaking of the neurilemma or sheath, I should have said that it is liable to become varicose or ampullated by pressure; this is not the case with the axis cylinder, which always maintains its rod or band-like form. It can be seen projecting beyond the torn or cut end of a fibre parted into strands, which indicates distinctly that it is of firmer and more fully organized consistence than the white substance of Schwann.

It should be mentioned that Gerlach holds that the horizontal fibres of the convolutions are non-medullated. I am not aware that this opinion has been accepted generally, except in the case of the outer thin bands or individual fibres which Cleland believes to be non-medullated.

Nerve Cells.

Lying amongst and between the fibres of the cortical substance, generally following their direction and closely associated with them, we have those all-important structures, the nerve cells; the organs whose special function is, we believe, to receive, generate, or transmit nervous influences.

Your attention has been already directed to the concentric lamination of the cortical substance (in connexion with the horizontal fibres), which was stated to be due, along with these fibres, to the presence, in greater or less number, of cells, and their arrangement and distribution.

This diagram illustrates the cortical layers of the occipital lobe coloured with hæmatoxilin. The preparation from which it is drawn was made from the occipital lobe of a healthy young man who had been suddenly killed by a railway accident. You will see at a glance that the gray matter is divided into six concentric layers. I also present a preparation coloured with carmine, kindly lent me by Dr L. Clarke, which illustrates the arrangement and distribution of the cells as described by him. You will first notice that all the cells follow the direction of the radiation of the fibres, their apices being outward; and, secondly, that they vary in shape, size, and number in various layers. The outer layer is thin, and contains few cells; in it are the ultimate fibrils of cell poles and of nerve fibres. The second is somewhat thicker, and holds numerous small cells and nuclei; the third is pale and thin, with few vesicular elements; the fourth also thin, but darkly coloured, and containing a large number of bigger cells than in the superjacent layers; the fifth is pale and thin, with comparatively few cells; the sixth is dark, and contains also large cells of about equal size with those of the fourth layer. This layer gradually merges into the seventh, which is white; it is, in fact, the thickest layer of horizontal fibres. (Lockhart Clarke, *vide* Maudsley's Anatomy and Physiology of Mind, p. 60, 2d edition.)

In a question involving such minute anatomical details, it is easy to believe that a considerable difference of opinion exists as to the exact number of layers; but in the present state of our knowledge it is needless for me to enter upon the discussion,—suffice it to say, that the general facts are admitted on all hands.

The nerve cells of the hemispheres have been described as pyramidal, oval, pyriform, and triangular, in shape. I am strongly inclined to agree with the opinion that they are more or less either spindle-shaped in the deeper layers, and pyramidal in the outer, and that the varieties described are due to the direction in which they have been cut in thin sections. The pyramidal cells are truncated at the base, the spindle cells maintain the spindle shape at both extremities. You will see how easy it would be to vary the shape of these cells apparently, if they were presented to the eye in transverse or oblique sections. Besides these large cellular structures, we have smaller ones which also differ in shape. Opinions differ as to whether these should be regarded as really cells, or as nuclei of the connective tissue; but there seems to be little doubt that they belong to the former. In the cerebellum, where they form a very important layer, they have been seen in intimate relationship with the large cells; and in the convolutions of the brain proper they exhibit many connexions which lead to the conclusion that their nature is of the higher order.

Lockhart Clarke states very definitely that the cells of the occipital lobe are almost uniform in size. This certainly does not coincide with the observations of Dr Cleland, Herbert Major, or myself, for we all have preparations of healthy brains in which we can show large cells in this lobe. The largest cells that I know of are in the convolutions on either side of the fissure of Rolando at the vertex—in the ascending frontal and ascending parietal convolutions. In this position, the cells of the fourth layer are very large. The nerve cell, as viewed under the highest available powers, consists of a finely-granular and fibrillated body, marked faintly with transverse striæ, a large nucleus, and a distinct nucleolus or nucleoli (Arndt, Wundt). Bennett asserts that they possess "a delicate cell wall, outside which is occasionally seen a layer of nucleated areolar tissue," and in so doing he stands alone. Although certainly not possessing a wall, the cerebral cell is encapsulated or enclosed in a space separating it from the surrounding tissues. The body of the cell consists of a protoplasmic substance, "similar to, though not identical with, pure protogon." The nucleus is more granular than the body, and the nucleoli are apparently homogeneous in structure.

The smaller or truly pyramidal cells, as shown on section, give off each one apical and two basal processes, but these latter are in reality more numerous. The former either runs outwards to the surface of the convolution, and ends like the terminal nerve fibre by inclining horizontally, or it is prolonged into one of the radiating fibres; the latter, springing from the angles of the base, are connected with both the radiating and horizontal fibres; and further, they are, according to Rindfleisch, Boll, and Wundt, connected with one another. The larger or more truly spindle-shaped cells have, in addition to the apical and angular basal processes, a large process, the axis cylinder process, which runs inwards and is connected with the fibres of the main white stem, and forms four to ten processes which spring from their sides. These large cells seem to have very intimate relations with the horizontal fibres by means of these poles, certain of which pass directly into them; and the cells themselves are figured by Cleland as departing from the usual direction—that of the plane of the radiating fibres—and following that of the horizontal band.

The Germans are in advance of British histologists in demonstrating the connexion established between cell and cell. In this diagram, copied from Boll, is shown the method of association: as the process recedes from the cell it becomes fibrillar or penicillated, and the fine fibrils actually join one another; thus maintaining an anastomosis not only between cells of the same layers, but also with those of the superjacent and underlying ones.

As we go along, I am desirous of pointing out the extreme intimacy of relations existing between the various regions of the brain by means of its various structures. Thus, we see cell communicating with cell by means of their processes; by means of the horizontal system of fibres, a direct connexion is maintained throughout the hemispherical ganglia between one part and another, and by the radiating fibres an association is kept up with the internal ganglion and the spinal cord. But remark this, that fibre-communication is maintained by individual fibres, which hold no relation one to the other except through the medium of cell processes. We have no evidence of fibre communicating directly with fibre, or even no certain proof that one series of fibres communicates directly with the others; in fact, all anatomical demonstration goes towards the establishment of individuality and isolation of fibre, the processes of the cells being the connecting links. Thus, the apical processes seem to become in certain instances connected with the fibres as they go to the periphery, and the basal processes loop with the horizontal fibres, and also by means of their recurrent poles with those of the central white stem.

If we accept the theory that these cells possess the vital property of generating, receiving, and transmitting nervous influences, it is not difficult to understand that morbid conditions of their structure must affect most seriously the whole economy; and further, that whatever tends towards the destruction of individual conductivity of fibre must be equally prejudicial. I hope to be able to show you that pathological changes can be demonstrated not only in the brains of the chronic insane, but in recent and acute cases.

In next lecture, we will discuss the blood distribution of the brain, its lymphatic system, the nature of its connective tissue, and the more recent facts and theories which have been elucidated by physiological research.

ARTICLE II.—*Royal Edinburgh Asylum Papers.* No. IV. *Case of Determined Suicidal Melancholia.* By JOSEPH J. BROWN, M.B., Assistant-Physician.

X. Y., æt. 25, admitted 15th August 1874, unmarried; member of the medical profession.

History.—Patient has always been a healthy man, and has suffered from no illness beyond a fever contracted in the discharge of his professional duties. He was a hard-working and very successful member of his profession, of a cheerful and kindly disposition, though always a little reserved, and very temperate in his habits. His maternal cousin was insane, but beyond this there is no hereditary history of insanity. Patient had a disappointment in the spring of the present year. This caused him considerable anxiety. He began to suffer from sleeplessness, accompanied with headache, and in the month of May exhibited decided symptoms of depression. This melancholic state increased, and his bodily health began to fail. He also had delusions that his soul was lost, that it was a crime for him to live any longer, and such like. He commenced to refuse his food, and, on one occasion, attempted to poison himself by taking belladonna, so was advised by his medical attendants to go to an asylum.

State on Admission.—Patient is emaciated and anæmic; muscularity is below the average, skin moist, temp. 98°; tongue furred at the base, red at tip and edges; appetite poor; bowels regular; pulse 74, small and weak; heart and lungs healthy. Patient complains of sleeplessness, and occasional headache, chiefly confined to the frontal region; pupils are equal and sensitive to light. There is considerable depression, shown by his expression, his total absence of interest in events going on around him, and by his own statement of the misery he suffers. At times he is restless, and walks rapidly about the corridors, but he is in no way violent. Memory is unimpaired; his conversation is rational and intelligent, so long as his own state of mind is not the subject of discussion; but it appears to be a great effort for him to talk of anything but his imagined crimes. He has delusions of a melancholic nature, such as, that his soul is for ever lost, that he has committed great crimes, and that he is wronging every one by allowing himself to live; and states that he ought to take away his life, and so end his misery, and lessen his punishment in the other world.

Course of Case.—*17th Aug.*—Patient had a restless night, and slept very little; he is somewhat excited to-day, and walks rapidly about the corridors. Yesterday he went out for a walk with his father, and attempted to choke himself by pushing his finger down his throat.

28th Aug.—Patient has been improving for the last few days, and it was considered advisable for him to take a walk in the country with an attendant. On his return he looked pale, and stated that he was not feeling well; but nothing was suspected further than that his walk had been too fatiguing for him. In the afternoon vomiting and diarrhœa came on, and after careful search a quantity of berries of the *Arbor vitæ* were found in his possession. He confessed he had swallowed some in the hope they would poison him, and that he had been collecting them for some time past when walking about the grounds. The berries had no injurious effect further than causing sickness with diarrhœa, and in the evening patient was comparatively well.

4th Sept.—Last night patient complained of pain in the abdomen, and informed his attendant that he had swallowed a quantity of small stones during his afternoon walk. This was found to be the case; for, on examination, a mass of small stones could be felt through the abdominal walls, confined to the region of the stomach, giving the sensation to the fingers as if pressing a bag full of marbles. Patient complained of heaviness, and a dull pain in the epigastric region, but no other symptoms were present. He was at once put to bed, and a full dose of castor-oil given; a diet of thick porridge and suet pudding only was allowed; and bismuth in gum-acacia was given every two hours.

5th Sept.—Patient had a quiet night, and slept well; complains this morning of pain in the abdomen. The bowels have been well moved, but none of the stones have been evacuated, and they can still be distinctly felt in the region of the stomach. Tongue furred; pulse 70, of good strength; temp. 98°.

Ordered to continue the same diet, with the bismuth mixture.

7th Sept.—Yesterday the stones could be felt in various regions of abdomen, and when the patient moved with a jerk, the stones could be heard to knock against each other. To-day only a few of them can be felt, and a quantity of them have been evacuated. He continues the same diet.

9th Sept.—Patient has apparently passed all the stones, as none can now be felt through the abdominal walls. They have been all carefully collected, their number being 82, varying in size from a bean to a pigeon's egg; the smallest weighs 20 grains, while the largest is a little more than half an ounce, and they weigh collectively 24 ounces.

Patient refuses to take any food, evidently with the hope of starving himself, so has to be fed with the stomach-tube.

12*th Sept.*—No more stones have been passed, and patient complains of no pain or uneasiness in the abdomen. He still continues to refuse his food, and has to be fed with the tube.

Yesterday a long nail, sharpened at the point, was taken from his pocket, also an 8-ounce bottle of whisky, which he had filled by keeping a little quantity in his mouth every day after dinner, which he had emptied into this bottle.

16*th Sept.*—Patient has continued in much the same state since last entry. This afternoon he got faint and sick, and after much questioning, he admitted he had taken a quantity of whisky which he had managed to conceal on admission. His breath smelt strongly of whisky, and there was every sign of intoxication. After a few hours' sleep he recovered, and he then told me he had taken it with the hope of destroying his life.

21*st Sept.*—Yesterday patient took his dinner, and lay down to rest on the sofa; at four o'clock, when he was to go out for his usual walk, he was found to be comatose. The muscles were flaccid; there was no reflex action, except just the faintest trace on touching the conjunctivæ; the face was pale, pulse small and weak, breathing slow, pupils considerably dilated and insensible to light; the surface of the body felt cold, and the breath had a marked ethereal odour. Patient was at once put to bed; hot bottles and blankets were used to keep up the temperature of the body; the stomach was washed out thoroughly with tepid water, the matter drawn off having the same peculiar odour as the breath. As patient still remained comatose, the breathing getting slower and the pulse weaker, a turpentine injection was administered per rectum, and mustard applied to various parts of the body; coffee and brandy were also given, and every means employed to restore consciousness. The breathing got slower, and scarcely perceptible; the pulse got weaker, and the muscles, instead of being flaccid, became at times convulsed. This condition commenced with a general tremor, then the fingers were clasped on the palm of the hand, and the muscles of the forearm and arm became contracted. In a few seconds the legs were attacked in the same way, and also the muscles of the neck, and the head was rolled from side to side. There were several attacks of this nature, and about 7 o'clock the breathing entirely ceased, when artificial respiration had to be employed for fully ten minutes. The breathing again commenced, the pulse increased in frequency, a quantity of tepid water was thrown into the stomach, which had the effect of causing copious vomiting (the vomited matter having the same peculiar odour), and from this time patient continued slowly to improve. The convulsions became less frequent, the breathing improved, and the pulse increased in frequency and in strength.

Reflex action returned first in the eyelids, then in the other muscles of expression, and gradually the patient got less and less comatose, till at 9 o'clock he could articulate indistinctly, and his appearance was that of a person suffering from a large overdose of alcohol. He continued to improve steadily.

21st Sept.—To-day patient is sensible and talks rationally. He refuses to give any information regarding the nature of the poison he took yesterday, nor can any trace of it be found, though careful search has been made. Pulse 74, of fair strength; temp. 98°.

28th Sept.—Patient has remained in the same state for the last few days; refusing his food, very wayward and depressed, and is evidently planning how to take away his life.

1st Oct.—Yesterday, while the attendant was painting a solution of guttapercha in chloroform on an excoriation over the patient's sacrum, he snatched the bottle, and swallowed, as nearly as can be ascertained, about two ounces of the mixture. Medical assistance was at once procured (10 A.M.), when the patient was found to be comatose, the respiration had ceased, the radial pulse was scarcely perceptible, and, with the exception of very slight closure of the eyelids on touching the conjunctivæ, all evidence of sensibility had entirely disappeared. The pupils were contracted, and insensible to light; the face was flushed, conjunctivæ injected, the muscles flaccid; the surface of the body being, however, moderately warm. Artificial respiration was at once resorted to, according to Sylvester's method, the air entering freely into the lungs. This was continued for a few minutes, but as natural respiration did not return, the stomach-tube was passed, and the stomach thoroughly washed out with tepid water, the guttapercha coming up in shreds of an inch to an inch and a half in length, the fluid also having a strong smell of chloroform; artificial respiration being of course continued during the operation.

The pulse at the wrist was now totally imperceptible, and all evidence of sensibility was gone. The surface of the body felt cooler, but on rubbing the skin with the hand a blush could be produced. Hot bottles were applied to the feet, and constant relays of warm blankets were used to keep up the temperature of the body; the air of the room was kept as pure and as warm as possible; an enema of strong coffee with brandy was administered, while the artificial respiration was diligently continued. The pulse was now felt at the groin 40 beats per minute; and though the heart's impulse could not be detected, yet the blood appeared to be sufficiently aerated, as no blueness of the lips was noticed, or of the extremities, and the temperature of the body improved after the application of the warmth. The pupils still remained contracted, the muscles flaccid, sensibility absent, and there was no appearance of natural respiration returning, though this was often anxiously watched for, the artificial method being discontinued for a few seconds at a time. Cold water was dashed on the face, and the galvanic battery was applied, but still the comatose condition continued, the pupils were strongly contracted and insensible to light, and the respiration was uninfluenced by the galvanic battery, the only signs of life being the pulsation of the femoral artery and the temperature of the body. At 12.45 P.M., feeble respiration commenced, which was indicated by a slight rising and falling of the abdominal walls; a stronger current from the galvanic battery was now applied, and liquor ammoniæ was held to the nostrils, while the artificial respiration was discontinued. The pulsation at the groin became less forcible, the lips got bluish in colour, and the surface of the body colder, so that artificial respiration was again resorted to as a means of assisting the feeble natural respiration. The pulsation became stronger, and for the first time could be detected at the wrist 44 per minute; the lips got a brighter colour, the temperature of the body improved, and at 1.30 P.M. the respiration was so forcible and regular (24 per minute) that the artificial method was discontinued. The pupils still remained contracted, and as there were no signs of returning sensation, the patient's head was lowered and his body raised till it was almost vertical, according to Nelaton's plan. This procedure caused dilatation of the pupils; but as it arrested the natural respiration, it was abandoned, and artificial respiration was again rendered necessary for ten minutes or longer. The stomach-tube was now passed after considerable difficulty, owing to the laxity of the parts and the extreme uncertainty of the respiration, and hot coffee and brandy were thrown into the stomach. The battery was applied, and every means resorted to that could be thought of to cause return of sensation. The patient remained in much the same condition, viz., complete insensibility, natural respirations 26 per minute, which had to be assisted artificially as the lips got bluish or the extremities cold; great contraction and insensibility of the pupils; pulse very feeble at the wrist, but distinct at the groin, 44 beats per minute and regular; surface of the body of natural temperature, except the extremities, which readily got cold. The battery was applied at intervals for a period of ten minutes or so, when it was noted that the pupils always became slightly dilated, though not to any great extent; also there was a slight sensitiveness of the conjunctivæ; the pulse also increased in frequency and in strength; but as soon as the current was discontinued, the patient lapsed into his former unpromising condition. He continued in this comatose state until about 5 P.M., when, after powerful stimulation with the battery and an enema of beef-tea, there was slight sensibility of the conjunctivæ observed, and the pupils became more dilated than they had ever been since the morning; the pulse increased from 40 to 65, and the respirations from 26 to 30 or 32; but on the withdrawal of the battery the comatose state returned. The battery and other means of stimulation were used at intervals until the patient was so far roused that he moved about in bed, the muscles of expression began to contract, and he attempted to speak. At about 7 P.M., he again became more comatose, the pupils contracted, the pulse diminished in frequency and in force till it was scarcely felt at the wrist; the face became very much congested, and ecchymosis appeared on the eyelids, thorax, and other parts of the surface; the respiration again was arrested, so that artificial respiration had to be resorted to, and the patient presented the appearance of a case of opium-poisoning in the last stage. The respiration was artificially kept up, warmth was applied to the surface, with occasional friction, and a milder current of the battery was frequently applied, until about 8.30 P.M., when, much to the surprise of those around him, the pulse became more frequent and forcible; the natural respiration returned, at first scarcely perceptible, but gradually increased in force and frequency; the face became less congested, and the surface of the body warmer; the sensibility of the conjunctivæ returned; the pupils became less contracted, and responded to light. These symptoms gradually improved, and patient showed a tendency to vomit. The stimulation was continued; the pulse increased to 100 per minute, respirations 30 per minute, and deeper than they had ever been; and at 10 P.M. he vomited a quantity of dark brown-coloured fluid of a viscid consistence. Sensation was more natural now; the pupils were dilated and sensible to light, but the respiration again ceased after the patient had vomited. The patient continued to vomit at intervals, and with this the other symptoms improved, viz., sensation and consciousness, the heart's action, the temperature of the body, and voluntary motion; but there was no return of the natural respiration, though this was carefully looked for. Artificial respiration was continued for some time, until it was observed that the application of the battery, or sudden friction of the surface of the thorax, caused an inspiration, and shortly afterwards (11.30) natural respiration again returned, at first indicated by slight rise and fall of the abdominal walls, but rapidly becoming stronger. Matters now assumed a more promising condition, as with a little judicious assistance of the respiration it became quite natural; the comatose state gradually passed completely off; he began to articulate, and shortly, when rubbed too hard, told those around him to "Go to hell," with a delightful vehemence, which, in this special instance, sounded most refreshing to the hearers. He was now (12 o'clock) considered to be so far recovered that he was allowed to sleep, being awakened every quarter of an hour, when beef-tea or ordinary tea was given him; but even in this semi-conscious state, his first impulse was to refuse his food, and it was only with difficulty that he could be persuaded to take even a very little.

8th Oct.—Patient has now recovered from the effects of the poisoning, and though he continues to refuse his food, and has to be fed frequently with the tube, yet his bodily health is improving. Mental condition remains the same.

Remarks.—This case affords a striking illustration of the great difficulty there exists in preventing a determined suicidal patient from accomplishing his object. In this patient there is no special enfeeblement of his intellectual powers, which were originally far above the average; his one and only object in life is to destroy it; and when we add to this condition the fact of his being a medical man, it will not be surprising if he evades the supervision of the most experienced attendant. On five distinct occasions he has attempted to commit suicide, the last being the most alarming. I wish to remark on this chiefly from its great toxicological interest. As stated in the case, the respiration had entirely stopped, when the patient was first seen within five minutes after he had taken the chloroform; but the action of the heart was not arrested, as the pulse could be felt at the wrist, which shows clearly that though chloroform in some cases may cause death by arresting the heart's action, yet in others it proves fatal by suspending the respiration. We had not mere failure of the respiration for a few seconds, nor was there any obstruction of the air-passages, but total suspension of the respiration existing for two hours and three-quarters, during which time it had to be performed artificially. During the progress of the case, even after natural respiration had been freely established, there was always a tendency to its arrestment, as was well shown when the patient recovered sensation, etc., about 11 P.M., and the natural respiration completely ceased for an hour. I may here also remark, that the heart, during the whole time he was under the influence of the chloroform, remained steady and regular in its pulsations, though it was diminished in force.

I think this case also affords an example of the great benefit derived from long-continued artificial respiration as a means of recovery under such circumstances, combined with various methods of stimulation to arouse the patient, and shows that our efforts should never be relaxed, nor our hopes of recovery given up in such cases. It was observed, however, that when the stimulation by the battery and other methods was too long continued, or too energetically applied, the sensibility of the nervous system became blunted and exhausted as it were, and the patient got more comatose afterwards. This condition was particularly marked about 7 P.M., when, after severe stimulation, the face became congested and the patient very comatose. After this time the stimulation was applied more mildly, and only after periods of rest of fully ten minutes.

ARTICLE III.—*Case of Sciatica depending on Pressure by an Intra-pelvic Tumour.* By C. J. MILL, L.R.C.S.Ed., Kirriemuir.

A. B., a strong, previously healthy, man, aged 45, employed in a factory for the last fifteen years, began to feel pain about the left hip at the commencement of this year, and was judiciously treated for sciatica during three months. Finding himself incapable of work, he came to Scotland, and after the middle of May last he put himself under my care.

At this time the pain was in the hip, extending down the leg, along the course of the sciatic nerve. There was no swelling or tenderness to be felt, and the limb could be moved in every direction without pain.

The nerve pain was subject to paroxysms of agony, recurring several times every twenty-four hours, and generally at night. His general health and appetite were good.

Having previously used quinine, it was continued in increased doses, with subcutaneous injections of morphia of ⅛ grain wherever the pain was severe. These gave decided temporary ease. Blisters were applied along the course of the nerve, then the actual cautery, aconite and chloroform liniment, electricity and aconite hypodermically, iodide of potassium, guaiacum—but all of no avail, or only with temporary relief.

The pain now (in the end of June) was chiefly over the heel and the metatarsus of the left foot, requiring ¼ grain of morphia hypodermically every six hours to make it bearable.

At this time Dr Traill, Arbroath, met me in consultation. We diagnosed some probable local pressure on the nerve, but hoped that continuance of the palliative treatment, with the addition of acupuncture, would wear out the over-sensibility of the nerve.

Several long needles were passed deep into the hip over the nerve and along its course down to the heel, and retained for two hours at a time.

The hip became decidedly easier after this, and we entertained sanguine hopes of the case; but these were soon dispelled, for the knee became the seat of pain, and there was œdema of the leg, with absence of pulsation at the poples and groin. Extensive abscesses formed along the sole of the foot, where the injections had so often been used, necessitating their discontinuance, and requiring the use of narcotics by the mouth in large doses during the months of July and August. The general health now rapidly gave way; the pulse became very feeble and rapid; a papular rash came out every day (he had once suffered from lues), succeeded by profuse sweats. The leg could not be moved in the slightest degree without fearfully increasing the pain.

A deep-seated hardness, with obscure fluctuation, was felt below the gluteal muscles, to which poultices were constantly applied, in the hope of matter forming there as it did in the foot.

At length, after four months of the most intense suffering I ever witnessed, he was cut off by rapid effusion on the brain.

Post-mortem.—As permission was given to examine only the leg, and as we believed the *origo mali* was about the hip, an incision was made down to the hip-joint, which was quite sound.

The cellular tissue was loaded with fat. The muscles were undergoing fatty degeneration, and had quite lost their red colour. On enlarging the incision I observed a large hydatid and some clots of dark blood at one side of it, and the edge of a large cyst appearing from below the muscles, which were quite detached from the dorsum ilii by it.

On tracing this cyst, it was found protruding through the sacro-sciatic opening, which it completely filled, and subjected the nerve to great pressure. When opened, fully a quart of medullary fatty matter, exactly resembling the medulla oblongata, mixed with hydatids, escaped. By dividing the sacro-sciatic ligament, this cyst was traced into the pelvis, which it completely filled, pressing and displacing all the pelvic viscera, and quite accounting for the extreme pain suffered, the want of circulation in the leg, difficulty of micturition and defecation.

The cyst had been punctured by the needles, allowing the escape of the hydatid, etc., first seen before it was opened, which gave some temporary relief. Our prognosis was thus proved correct, and the treatment vindicated. I believe the heart would have been found in the same state of fatty degeneration, the cause of the feeble thready pulse, and of the ultimate effusion on the brain.

ARTICLE IV.—*Fracture of the Styloid Process of the Ulna.* By MR NEIL MACLEOD.

M. S., aged 32, at 10 P.M., on 13th September 1874, disabled his right hand, in a fight, by a blow on his antagonist's face. He presented himself at the Royal Infirmary at 8.30 A.M. on the following day, complaining of pain near the wrist and inability to use the hand.

The forearm was between pronation and supination, and the disabled hand supported on the other. On comparing with the other hand there was no antero-posterior or lateral displacement, but there was slight ulnar flexion. On fixing *both* bones of the forearm and moving the hand and wrist, no crepitus could be elicited. The same result followed fixation of the *radius alone;* but on fixing the *ulna alone* a little above the styloid process, distinct crepitus was obtained on moving the hand and wrist antero-posteriorly. Farther, no crepitus could be obtained by manipulation of the lower end of the ulna alone; but on fixing the wrist and lower end of the radius with one hand, with the other the distal end of the ulna could be pushed from its normal position forwards or backwards, more especially the latter.

Diagnosis.—Fracture of the styloid process of the ulna, and separation of the triangular cartilage.

ARTICLE V.—*On the Pecuniary Value of the Emoluments and Pensions of Army Medical Officers.* By Surgeon-Major F. DE CHAUMONT, M.D., F.R.C.S.E., Army Medical Department.

A GOOD deal has been written and said on many sides about the condition of the Army Medical Department, but the majority of the statements have been rather vague than exact as regards the real value of the prospects of medical officers on entering the service. Considering the importance of the subject as bearing on the welfare of the department, both in reference to its efficiency as a servant of the State and to the wellbeing of its individual members, I have thought it would be well to try and reduce the matter to a numerical expression that should give a fair approximation to the actual truth. To make the inquiry more complete, I have also tried to get a similar numerical value for the emoluments of former periods, so as to compare the advance the pecuniary circumstances of the department have made within a certain number of years. The results in those cases must obviously be less accurate than the estimate for the present time, as the data are less available, and even more complicated in character. There are therefore three periods to consider, viz.:—

1. The present time, under the warrants of 1858 and succeeding years.
2. Quarter of a century back, just before the Crimean war—say the years 1850–53, under the warrant of 1840.
3. Three-quarters of a century back, under the warrant of 1804.

These are the chief landmarks in the history of the department. The warrants in question not only affected the pay, but created and abolished various ranks, the tendency being, however, gradually to diminish the *number* of different grades, and to make length of service furnish the chief emolument. Into the question of rank I do not propose to enter, as it does not affect the matter under consideration, except in so far as it gives claim to certain rates of allowances.

In speaking of the *administrative* grades, it will be understood that I include in these the inspectors-general and deputy inspectors-general of hospitals, now styled surgeon-general and deputy surgeon-general. All grades below these are considered *executive* officers. Some exception may perhaps be taken to the method of estimating the chances of promotion to the administrative grades, the value being apparently so small, but I do not see how any higher value could accurately be attached to them.

I have not made any special estimate of the value of the administrative appointments in India; but I think on the whole that the amount would be comparatively small, and would hardly affect the results in an appreciable degree. In like manner the value of half-pay in case of sickness, and of pensions to widows and children, would be somewhat difficult to estimate correctly, but I do not think it would materially change the results.

I. PRESENT TIME.

For the purposes of the calculations which follow, the subjoined *data* require to be known:—

1. Average age of entry into the service.
2. Probability of life.
3. Rates of pay and allowances.
4. Rate of retirement.
5. Prospects of promotion to administrative grades.

I shall first speak of each of these, and then proceed to the method of estimation.

1. *Average age of entry into the service.*—As the regulations of all the licensing bodies require a qualified practitioner to be 21 years of age, it is obvious that each army candidate must be at least a little older than this. On the other hand, a good many men are over 21 before taking their diploma, and some have even been in practice one or two years before coming up for the service. The limit of age by the army regulations is 28 years, but on the whole the majority of candidates are nearer 21 than 28, and I think I shall be taking a favourable estimate if I adopt 22 as the average age of entry.

2. *Probability of life.*—The probability of a good life at 22 years of age is about 40 years. But we know that the mortality in the Army Medical Department is more than double that of the same age at home; I therefore propose 37 years as a fair probability.[1]

3. *Rates of pay and allowances.*—In calculating these I have assumed that the medical officer *always* enjoys his full pay and allowances without deduction; also, that when living out of barracks he gets lodging allowance continuously; also, that all privileges of forage and servants are fully and continuously granted. It is well known that these conditions are not constant, and therefore the present estimate is a favourable one.

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[1] Adult males in England die at the rate of 9 to 10 per 1000; present death-rate of army officers, exclusive of medical, 15 per 1000; medical officers, from 1839 to 1854, 34 per 1000; during the Crimean war, 67 per 1000; since the Crimean war, about 20; average death-rate for 30 years, 30 per 1000. It is further to be noted that this death-rate is not swollen by increased deaths among the older officers, as in civil life, for the greatest mortality is among the younger men.

Let us, however, adopt the recent rate of 20 per 1000. Of the 945 officers of the department the following distribution may be made, according to service and age (age of entry being 22 years):—

Surgeons, . . .	500,	from 22 to 37 years of age.
Surgeons-major, . .	400,	„ 37 to 55 „ „
Administrative officers,	45,	„ 50 to 65 „ „

According to different tables of mortality, we find that out of 100,000 born alive there are at 22 years of age living:—

4. *Rate of retirement.*—I have assumed that the officer serves for 20 years, and then retires as a healthy man on 12s. a day; or for

	English Life Tables. Males (Farr).	Upper-class experience. Males (Ansell).
	64,082	78,553
At 37 years of age respectively, . .	55,133	68,080
Losses in 15 years, ...	8,949	10,473
Equal to a rate of mortality per 1000 per annum of	9·27	8·89
At the age of 37 there are living (as above),	55,133	68,080
At the age of 55 there are living, . .	40,946	54,592
Losses in 15 years, ...	14,187	13,488
Equal to a rate of mortality per 1000 per annum of	17·15	13·21
At the age of 50 there are living, . .	45,573	58,351
At the age of 65 there are living, . .	29,459	42,977
Losses in 15 years, ...	16,114	15,374
Equal to a rate of mort. p. 1000 p. an. of	36·47	23·80

From the English tables, therefore, the death-rate of the department ought to be:—

500 @ 9·27 = 4635·00
400 @ 17·15 = 6860·00
45 @ 36·47 = 1641·15
945)13136·15

Equal to 13·9 per 1000 as mean rate.

From this it appears that the actual death-rate of the department is 44 per cent. greater than that of males in civil life of all classes.

From the upper-class experience (which includes the medical profession) we find the death-rate ought to be:—

500 @ 8·89 = 4445·00
400 @ 13·21 = 5284·00
45 @ 23·80 = 1071·00
945)10800·00

Equal to a rate of 11·43 per 1000 per annum.

From this we see that the medical officer dies at a rate 75 per cent. greater than males of his own class in civil life.

The number of males living at the age of 22 would, at the respective rates, be reduced to *one-half* in the following number of years (by the formula $n\,(1-r)^t = \frac{1}{2}$, where n is the number living at the age of 22, r the rate of decrement, t the number of years sought). Here it is evident that

$$t = \frac{\log.\ \frac{1}{2}}{\log.\ (1-r)}$$

Upper-class experience, ...	in 60·3 years.
English life tables, ...	in 49·5 „
Actual death-rate of medical officers, . .	in 34·3 „

If we take the average death-rate as shown before, viz., 30 per 1000, we shall find the result to be only 22·8 years.

We thus see that the value of life, even at the lowest rate of mortality, is only 69 per cent. of the value of civil lives of all classes, according to the English life tables, and only 57 per cent. of that of professional men in civil life. Now, taking the relative expectation (or probability) of life as equal to the time in which the number of living at any age is reduced to *one-half*, we have the following:—

Upper-class experience, ...	47·4 years.
English life, ...	40·5 „
Army medical officers, ...	27·5 „

Or, taking the higher rate of 30 per 1000—

Army medical officers, ...	18·6 „

It will therefore be admitted that the expectation of 37 years, as adopted in the paper, is a very liberal one.

25 or 30 years, and then retires on 20s. a day at either of these periods. He is, properly speaking, not entitled to the latter until after 33 years (or at the age of 55, beginning at 22), but I have adopted the above data as being quite within the truth.[1]

5. It is difficult to estimate the prospects of promotion to the administrative grades, but it may safely be assumed that, as matters are at present, such promotion can hardly be hoped for before 30 years' service. Now, out of a department numbering something over 900, there are only 43 administrative officers (10 surgeons-general and 33 deputies), or 1 to 21.[2] But many of the junior officers retire comparatively early, some by resignation and some from ill-health, so that the ratio is even smaller. I think, therefore, I am not making a very erroneous estimate in taking the chances of reaching the administrative grades as 1 to 22 for a surgeon[3] just entering the army; his chance of serving as a deputy-surgeon-general for more than five years, as 1 to 25; his chance of promotion to surgeon-general, as 1 to 28; his chance of completing his time in that rank up to the age of 65, as 1 to 30; and his chance of enjoying the pension of that rank up to 70 years of age, as 1 to 40.

Method of Calculation.

I have taken the aggregate pay and allowances for each period, and estimated the present value of them at the time of entry into the service; also the value of the pension and the value of the prospects of promotion. These are estimated (except the first period) as *deferred annuities*. From the sum thus obtained I have then calculated out the amount of annuity that could be obtained for certain periods, and assumed this as the total value of the prospects. In all cases 5 per cent. compound interest is taken as the basis, as is done by Government in estimating commutations under the Act for commuting pensions.

The first five years are estimated as an ordinary annuity by the formula:—

$$v = \frac{a\,(r^t - 1)}{r^t\,(r - 1)} \qquad [1]$$

where v is the value of the annuity, a the annuity, r the amount of £1 for one period (in this case 1·05), and t the number of periods during which the annuity is to be paid.

The subsequent yearly emoluments are treated as *deferred annuities*, or *annuities in reversion*, and are calculated by the formula:

---

[1] He may retire invalided by a medical board at 25 years of age on 20s. a day, but if he is in good health he is only entitled to 18s. 10½d. I have, however, neglected this trifling difference; but if it were reckoned, it would diminish the value of his prospects by about £25 in immediate value, and the annuities by about as many shillings.

[2] The actual number in the department is at present about 945; but if we include in the administrative ranks the director-general (whose promotion of course gives a step), and the professor of military surgery at Netley, the proportion comes out about 1 to 21, as adopted above.

[3] Now the junior rank of the department, formerly styled *assistant-surgeon*.

$$v = \frac{a\,(r^{t} - 1)}{r_{(n+t)}\,(r - 1)} \qquad [2]$$

where the meaning of the symbols remains the same, with the addition of n, which means the number of periods elapsed before the time t begins.

The rates of pay and allowances are the following:—

Rank.	Service.	Daily pay.	Servant.	Estimated value of lodging, fuel, and light.	Value of forage and stable allowance.	Total.
Surgeon,.......	1st to 5th year,	10s.	1s.	1s. 6d.	...	12s. 6d.
"	6th "	12s.6d.	1s.	1s. 6d.	...	15s.
"	7th to 10th "	12s.6d.	1s.	2s. 4d.	...	15s.10d.
"	11th to 15th "	15s.	1s.	2s. 4d.	...	18s. 4d.
Surg.-major,..	16th to 20th "	20s.	1s.	3s.	2s. 4d.	26s. 4d.
"	21st to 25th "	24s.	1s.	3s.	2s. 4d.	30s. 4d.
"	26th to 30th "	27s.	1s.	3s.	2s. 4d.	33s. 4d.
Pension on retirement at 20 years' service,...............		12s.	...	...	...	12s.
Do. do. at 25 years, or at 30 years' service,........		20s.	...	...	...	20s.

The annual amounts are as follows:—

1st to 5th year,	£228
6th "	273
7th to 10th "	288
11th to 15th "	353
16th to 20th "	480
21st to 25th "	554
26th to 30th "	607
Pension at 20 years,	£219
" at 25 or 30 years,	365

Now, the present values of the above at the time of entry into the service (treating them as *certain* annuities), is the following:—

1st to 5th year (by formula [1]),	£987
6th " (by formula [2]),	204
7th to 10th " "	762
11th to 15th " "	938
16th to 20th " "	794
21st to 25th " "	904
26th to 30th " "	776
Or a total value of	£5365
Add value of pension after 30 years, with probable duration of 7 years,	489
Total value,	£5854

This sum, at 5 per cent. compound interest, would yield an annuity of £381 for 30 years, or £350 for 37 years—that is, for the probable duration of life we have assumed—or an annuity in perpetuity of £293.

Value of Emoluments and Pension at 25 Years' Service.

Emoluments, ...	£4589
Pension at 20s., ...	955
Total value, ...	£5544

This would yield in annuities for 37 years £332; for 30 years, £360; for 25 years, £390; in perpetuity, £277.

In the case of the officer electing to retire at 20 years, the value of his emoluments during that time would be:—

Emoluments for 20 years, ...	£3683
Value of pension, to begin at 20 years' service, and continue probably for 17 years, . .	930
Total value, ...	£4613

This, as above, would yield an annuity for 20 years of £370; for 30 years, £301; and for 37 years, or probable duration of life, £276; or in perpetuity, £231.

Value of Emoluments on Promotion to the Administrative Ranks after 30 Years' Service.

The pay and allowances of the administrative ranks are as follows, presuming that the officer is promoted to be deputy-surgeon-general at 30 years' service, and serves eight years in that rank, that he is then promoted to the rank of surgeon-general, and serves five years in that rank, retiring ultimately at the age of 65 years:—

Rank.	Service.	Daily pay.	Servants.	Estimated value of lodging, fuel, and light.	Value of forage and stable allowance.	Total.
Dep.-surg.-general...	31st to 35th year,	35s.	1s.	4s. 6d.	4s. 8d.	45s.2d.
„	36th to 38th „	37s.	2s.	5s. 6d.	7s.	51s.6d.
Surg.-general,	39th to 41st „	50s.	2s.	8s. 3d.	7s.	67s.3d.
„	42d and 43d „	50s.	3s.	11s.	11s. 8d.	75s.8d.
Pension on retirement at 65 years of age, and 43 years' service, ...		37s.6d.	...	...	...	37s.6d.

The annual amounts would be as follows:—

31st to 35th year, . . .	£825
36th to 38th „ . . .	937
39th to 41st „ . . .	1227
42d and 43d „ . . .	1380
Pension at 43 years, . . .	£684

The present value of these at time of entry into the service (treating them as certain annuities) would be:—

31st to 35th year (by formula [2]), .	£792
36th to 38th „ „ . .	475
39th to 41st „ „ . .	542
42d and 43d „ „ . .	360
Total value,	£2169
Add value of pension at 43 years' service, to be enjoyed 5 yrs. up to 70 yrs. of age,	360
Total value,	£2529

Adding this on to the value of the previous 30 years, we have:—

First 30 years (omitting pension),	£5365
Administrative rank and pension,	2529
Grand total value,	£7894

This would yield annuities as follows:—

For 30 years,	£513
„ 37 „	473
„ 48 years, making life a certainty up to 70 years,	437
Or in perpetuity,	395

The above exceed the 30 years' estimate previously made by
£132 for 30 years,
£123 for 37 years.

But this is treating both the fact of promotion and the duration of life up to 70 years as *certainties*, which we know they are not. I have shown that the chances of promotion are small, and probably not more than the following:—

31st to 35th year,	1 : 22
36th to 38th „	1 : 25
39th to 41st „	1 : 28
42d and 43d „	1 : 30
Pension up to age of 70,	1 : 40

Or a mean chance of about 1 : 29½; but I shall adopt the number 26 and the ratio as 1 : 26, so as to be well within the limits of error. Dividing, then, £2529 by this number (*i.e.*, 26), we reduce the value of the chances to about £95, which we must add on to the 30 years' estimate, *including pension.*

We have thus:—

Value of 30 years' emoluments *plus* pension after that time,	£5854
Value of chances of promotion to administrative ranks and pension up to 70 years of age,	95
Total value,	£5949

This would yield an annuity as follows:—

For 30 years,	£388
„ 37 „ (probable duration of life),	356
Or in perpetuity,	297

Or the chances of promotion to the administrative ranks are equal to about £6 or £7 per annum.

It follows then, from the above statement, that the value of a commission in the medical department of the army is equal to an annuity for life of about £356, assuming health and full pay service for 30 years and life for 37 years to be certainties. Against this must be placed the various compulsory contributions and subscriptions the officer is called upon to pay, and the fact that he does not get the full value of the allowances credited to him above, particularly if he should marry under 15 years' service, when he rarely gets lodging money or adequate quarters. The recent warrant, too, has deprived him to a great extent of forage allowance. A further set-off is the expense of moving about from station to station, which is very serious, especially for young married officers, moves being considerably more frequent now than in former times. On the other hand, there are certain advantages to be stated *per contra*.

1. The *certainty* of the pay: the medical officer can live on his pay, and so is spared in early days much of the anxiety attaching to the struggles of civil life.

2. The work is not severe, and he has a large amount of time to himself.

3. He is pretty certain of a definite amount of leave each year, which he can take without the danger to his prospects that might happen in civil life.

4. There is a *certain* provision in sickness.

5. He can look forward to a definite period of retirement.

6. There is a small but certain provision for his widow and family.

7. There is increased pay in foreign stations, although it is only in India that this is of much consequence. At the same time, this is counterbalanced to a certain extent by increased expenses incurred in separation of families, increased premiums of life insurance, and the like, and by the grave dangers to life and health from exposure to unhealthy climates.[1]

It would be hardly possible to state the numerical values of the above *juvantia* and *lædentia* with any approach to accuracy, but we may probably assume that the net value of a medical commission is about equal to a life annuity of £300, or probably a little more, say £320, allowing for possible retirement earlier than 30 years, and possible sickness and loss on half-pay.

II. ESTIMATE OF EMOLUMENTS IN 1850-53, UNDER THE WARRANT OF 1848.

The department was much smaller before the Crimean war, the total number being only about 660, of whom 23 were in the administrative grades (inspectors and deputy-inspectors). The pay was smaller, and an officer, whatever might be his length of service, had to serve for two years on the *lowest* rate of pay in each rank. The allowances were much less liberal, for relative rank was merely nominal, and did not carry with it the substantial advantages it does at the present time. A surgeon, however, although he only ranked as a captain, was allowed forage for a horse on the same terms as a cavalry officer. Promotion did not go by seniority in the army, but in the station; this produced certain anomalies which complicate a little the present inquiry. Looking over the army lists of 1850-53, I find that the average service on promotion from assistant-surgeon to surgeon was about ten years (a fraction less). A surgeon was generally promoted to be staff-surgeon of the 1st class at 25 years' service; he would probably become deputy-inspector-general at 30 years' service, and inspector-general at 40 years' service, retiring from the latter rank after holding it three years, as was then the rule. Retirement could be claimed even in good health at 25 years. We have, therefore, three sets of conditions to consider:—

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[1] The Sanitary Report of the Madras Presidency for 1873, just issued, contains a paper by Dr Cornish, in which he shows that the death-rate of the Madras Medical Department is only 15·7 per 1000, considerably under that of the British service as above shown.

1. An officer serving for 25 years and then retiring on 13s. a day.
2. „ „ 30 „ „ „ 17s. a day.
3. The proportion of chances of promotion to the administrative grades and pension in those grades.

Taking these *seriatim*, we have the following:—

1. *An officer serving* 25 *years and then retiring.*

Rank.	Service.	Daily pay.	Estimated value of allowances, etc.	Daily total.	Annual total.
Assist.-surg.	1st to 10th year	7s. 6d.	2s. 6d.	10s.	£183
Surgeon .	11th and 12th „	13s. 0d.	4s. 9d.	17s. 9d.	£324
„	13th to 20th „	15s. 0d.	4s. 9d.	19s. 9d.	£360
„	21st to 25th „	19s. 0d.	4s. 9d.	23s. 9d.	£433
Pension after 25 years, to be probably enjoyed for 12 years, up to 37 years as the expectation of life,				13s.	£238

The present values of these sums at the age of 22—that is, on entering the service—would be £4361 in one sum, which would yield (at 5 per cent.) annuities as follows:—

For 25 years, . . .	£309
„ 30 „ . . .	284
„ 37 „ . . .	261
In perpetuity, . . .	218

2. *Case of an officer serving for* 30 *years and then retiring.*

The first 25 years would be as above given (omitting the pension at 25 years).

Service.	Daily pay.	Estimated value of allowances, etc.	Daily total.	Annual total.
26th & 27th years, Staff-surgeon of the 1st Class	19s.	8s. 8d.	27s. 8d.	£499
28th to 30th „ „	24s.	8s. 8d.	32s. 8d.	£590
Pension after 30 years' service,	...	...	17s.	£310

The present value on entering into the service would be as follows:—

Value of emoluments during 30 years' service,	£4443
Value of pension after 30 years' service, .	415
Total value in one sum, .	£4858

This would yield annuities as follows:—

For 30 years, . . .	£316
„ 37 „ . . .	291
In perpetuity, . . .	243

3. *Promotion to administrative grades.*

Rank.	Service.	Daily pay.	Estimated value of allowances, etc.	Daily total.	Annual total.
Deputy Inspector-General,	31st & 32d years	24s.	8s. 8d.	32s. 8d.	£590
„	33d to 40th „	30s.	8s. 8d.	38s. 8d.	£700
Inspector-General,	41st & 42d „	36s.	12s.	48s.	£875
„	43d „	40s.	12s.	52s.	£949
Pension after 43 years' service, to be probably enjoyed 5 years, np to the age of 70, ...				30s.	£548

The commuted value of these would be (at time of entry into the service) £1831, that is, if promotion and life up to 70 years of age were certainties. But I have shown that the number of administrative officers was only 23 in a total of 660, or 1:29, so that we legitimately adopt about 1:33 as the mean chance of assistant-surgeon reaching the higher grades, serving in them up to the age of 65, and then enjoying a pension to the age of 70. Dividing £1733 then by 33, we have £56 as the pròportionate value of the chances. We must therefore add this on to the previous estimate:—

Value of emoluments for 30 years, and pension after that time, .	£4858
Estimated value of chance of promotion and pension in higher grades, .	56
Total present value, .	£4914

This would yield annuities as follows:—

For 30 years, ...	£320
„ 37 „	294
In perpetuity, ...	246

This shows an apparent gain in the present time of £1035 of present value, equal to a life annuity of £62, or a perpetual annuity of £52, or about 21 per cent.

III. ESTIMATE OF THE EMOLUMENTS OF A MEDICAL OFFICER AT THE BEGINNING OF THE CENTURY, UNDER THE WARRANT OF 1804.

The following table gives the scale of full and half pay as then established:—

Table of Full and Half Pay under the Warrant of 1804.

Rank, etc,	Daily Full Pay.			Daily Half Pay.			Remarks.
	£	*s.*	*d.*	£	*s.*	*d.*	
Hospital Mate, at home,	0	6	6	0	2	0	Warrant Officer up to 1804, when he was commissioned by the King; in 1813 called Hospital Assistant; abolished, and Assistant-Surgeon to the Forces substituted, 1830.
„ abroad,	0	7	6				
Assist.-Surg., Cavalry,	0	8	6	0	3	0	The additional shilling in the cavalry was to cover the expense of keeping a horse.
„ Infantry,	0	7	6				
Apothecary and Surgeon of a recruiting district, . . .	0	10	0	0	5	0	
Regimental Surgeon,	0	11	4	0	6	0	
Do., after 7 years' service in the rank, or 10 in the army, .	0	14	1	0	6	0	
Do., after 20 years army, ...	0	18	10	0	6	0	
If compelled to retire, from bad health, at 20 years' service,	...			0	10	0	
Regimental Surgeon, 30 years' service, .	...			0	15	0	Could retire even in good health.
Surgeon to the Forces,	0	15	0	0	6	0	Entitled to the same increase for service as the Regimental Surgeon.
Physician to Forces,	1	0	0	0	10	0	Replaced in 1830 by Assistant-Inspector; abolished 1840.
Deputy-Inspector of Hospitals,	1	5	0	0	12	6	
Do. after 20 years in the army, . . .	1	10	0	0	15	0	The suffix *general* to the titles of Inspector and Deputy-Inspector was abolished by this warrant.
Inspector of Hospitals, ...	2	0	0	1	0	0	
Principal Inspector-General, ...	2	0	0	...			Members of the Medical Board.
Surgeon-General, .	2	0	0	...			
Physician-General, .	2	0	0	...			
In 1814 a Director-General was substituted for the members of the Medical Board, at a salary of £2000; on the next appointment, in 1852, the pay was reduced to £1200, and in 1858 it was raised to £1500, at which it now stands.							The allowances continued much the same up to 1858, according to the relative rank of the officer, with a few minor differences, such as the money value of forage, which, however, are hardly material to notice.

There is some difficulty in estimating the emoluments and prospects of a medical officer in the early part of the century, on account of the irregular and anomalous way in which promotion appears to have been made, and the peculiar relations of the different ranks. Sometimes an officer was removed from a junior rank to a high one without passing through the intermediate grades; sometimes (although less frequently than before the warrant of 1804) medical men were appointed from civil life to high positions in the service. Looking back, however, at old army lists, I find the following to be about the average length of service:—

Rank.	Total Service on Appointment.	Service in the Rank.
Hospital Mate or Assistant, . .	0	2¼ years.
Assistant-Surgeon, ...	2¼	9 "
Regimental Surgeon, ...	11¼	7 "
Staff-Surgeon, ...	18¼	3¼ "
Assistant Inspector or Physician,	21½	13½ "
Deputy Inspector, ...	35	10 "
Inspector, ...	45	3 to more years.

I think it will be sufficiently near the truth for our purpose to take the following rates, which will not, I think, differ very much from the true mean:—

		Total Service.
Hospital assistant, . . .	4 years in the rank, .	4
Assistant-surgeon, . . .	10 " .	14
Surgeon, ...	11 " .	25
Staff-surgeon or Assistant Inspector, ...	5 " .	30
Deputy Inspector, . . .	10 " .	40
Inspector, ...	3 " .	43

He might retire at 30 years' service on 15s. a day, or as an inspector at 43 years' service on 20s. a day.[1] There appears, however, to have been no special limit of age or service at which he was compelled to retire.

The present or commuted value of the pay, allowances, etc., of 30 years' service on entry into the service, would be	£3773
Value of pension after 30 years, to be probably enjoyed for 7 years, ...	344
Total value,	£4117

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[1] The half-pay in all grades, and the full-pay in the higher ranks, were subject to a deduction of about 5½ per cent. for *poundage* and *agency*; the pay in the executive ranks is stated *net*. This deduction is allowed for in the calculations.

This would yield annuities as follows:—

For 30 years, ...	£268
„ 37 „ (or probable duration of life),	246
In perpetuity, ...	206

The commuted value of the pay, allowances, and pensions of the administrative grades would be £1686. I have estimated the chances of reaching those grades as 1 : 40, which may perhaps be considered too low; but even if they were estimated at 1 : 30 it would hardly make a difference of £1 in the value of the annuity. Dividing then £1686 by 40, we have £42 to be added on to the previous sum:—

Total value of 30 years, as above, . . .	£4117
Estimated value of chances of promotion and pension in the higher grades, . . .	42
Total value,	£4159

This would yield annuities as follows:—

For 30 years	£270
„ 37 years (probable duration of life),	249
In perpetuity, ...	208

From this we find that the apparent gain by the warrant of 1840 over that of 1804 amounted to a present value of £755, equal to a perpetual annuity of £38, or a ratio of about 18 per cent.; whilst the apparent gain under the existing warrants over that of 1804 amounts to a present value of £1790, equal to a perpetual annuity of £90, or a ratio of about 43 per cent.

I have added a table of the most important results of the calculations, so as to render comparison more easy.

In conclusion, I may point out that the relative value of money is an important element in the question, but this is not easily determined, although there can be no doubt that the value is less at the present time than during the former periods. It would also be useful to have a comparison between the emoluments of the army medical service and the mean earnings of civil life, but I am not in possession of sufficient data to make the comparison, which I therefore leave to others more competent to do so.

A Comparative Table of the Values of the Emoluments, Prospects, and Pen-
they were under the Warrants of 1804 *and* 1840; *calculated as explained in*

Warrant of 1804.					Warrant of 1840.—Years 1850–53, just before Crimean War.								
Length of service and conditions of retirement.	Ranks and service in each.	Present or commuted value of emoluments and pension at time of entry into the service, age 22 years.	Annuities purchasable for sum in previous column at 5 per cent.		Length of service and conditions of retirement.	Ranks and service in each.	Present or commuted value of emoluments and pension at time of entry into the service, age 22 years.	Annuities purchasable for sum in previous column at 5 p. cent.			Nominal gain over the Warrant of 1804.		
			For 30 years.	For life or 37 years.				For 25 years.	For 30 years.	For 37 years or life.	Commuted value.	Annuities. 30 years.	Annuities. 37 years.
No provision for retirement except from sickness at 20 years' service.					No provision for retirement except from sickness at 20 years' service.								
No provision for retirement except from sickness at 25 years' service.					25 years' service. Retire on 13s. a day, or £237 per annum.	Assist.-surgeon, 10 years; surgeon, 15 years.	£4361 Annuity perpetual at 5 p. c., £218	£309	£284	£261			
30 years' service. Retire on 15s. a day, £274 per annum, less 5¼ per cent.	Hospital-mate, 4 yrs.; assist.-surgeon, 10 yrs.; regimental or staff-surgeon, 11 yrs.; assist.-inspector, 5 yrs.	£4117 Annuity perpetual at 5 p. c., £206	£268	£246	30 years' service. Retire on 17s. a day, or £310 per annum.	Assist.-surgeon, 10 years; surgeon, 15 years; staff-surgeon, 1st class, 5 yrs.	£4858 Annuity perpetual at 5 p. c., £243		£316	£291	£748 Annuity perpetual at 5 p. cent., £37 Ratio =	£48 18 per	£45 cent.
30 years' service. Retire as above stated.	Same as above, but adding on the proportion of chances of promotion to administrative grades, and pension in those grades.	£4159 Annuity perpetual at 5 p. c., £208	£270	£249	30 years' service. Retire as above stated.	Same as above, but adding on the proportion of chances of promotion to administrative grades, and pension in those grades.	£4914 Annuity perpetual at 5 p. c., £246		£320	£294	£755 Annuity perpetual at 5 p. cent., £38 Ratio =	£50 18 per	£45 cent.

sions of Army Medical Officers, as they are under the Existing Warrants, and as the paper to which this Table is attached.

Warrants of 1858 and subsequent years, as at present in force.													
Length of service and conditions of retirement.	Ranks and service in each.	Present or commuted value of emoluments and pension at time of entry into the service, age 22 years.	Annuities purchasable for sum in previous column at 5 per cent.				Gain (nominal) on the Warrant of 1840 (say in quarter of a century).				Gain (nominal) on the Warrant of 1804, in three quarters of a century.		
							Commuted value.	Annuities.			Commuted value.	Annuities.	
			For 20 years.	For 25 years.	For 30 years.	For 37 years or life.		25 years.	30 years.	37 years.		30 years.	37 years.
20 years' service. Retire in good health on 12s. a day, or £219 per annum.	Surgeon, 15 years; surgeon-major, 5 years.	£4613 Annuity perpetual at 5 p. c., £231	£370	£327	£301	£276							
25 years' service. Retire on 20s. per day, or £365 per annum.	Surgeon, 15 years; surgeon-major, 10 years.	£5544 Annuity perpetual at 5 p. c., £277		£390	£356	£329	£1163 Annuity perpetual at 5 p. cent., £59 Ratio	£81 = 27 per	£72 cent.	£68			
30 years' service. Retire on 20s. a day, or £365 per annum.	Surgeon, 15 years; surgeon-major, 15 years.	£5854 Annuity perpetual at 5 p. c., £293			£381	£350	£996 Annuity perpetual at 5 p. cent., £50 Ratio	= 21 per	£65 cent.	£59	£1737 Annuity perpetual at 5 p. cent., £87 Ratio =	£118 42 per	£104 cent.
30 years' service. Retire as above stated.	Same as above, but adding on the proportion of the chances of promotion to the administrative ranks, and pension in those grades.	£5949 Annuity perpetual at 5 p. c., £297			£388	£356	£1035 Annuity perpetual at 5 p. cent., £52 Ratio	= 21 p.	£68 cent.	£62	£1790 Annuity perpetual at 5 p. cent., £90 Ratio =	£118 43 per	£107 cent.

ARTICLE VI.—*Upon the Medicinal Properties of Silica in Cancer, Fibroid Tumours, and Diabetes.* By R. FAWCETT BATTYE, M.R.C.P. Ed., etc., London.

IN using a new remedy for any class of diseases, be they malignant or non-malignant, acute or chronic, some reason or theory is expected from the writer who advocates the trial of a remedy he announces.

The remedy here suggested as a medicinal agent is silica—a substance, so far as the writer knows, entirely new, when administered internally, and whose effects can have no existence till reaching the circulation.

It will be naturally asked, What circumstances could lead to the supposition that a hard stone or flint could ever possess any medicinal properties by entering the circulation? And, again, How can it be prepared so as to be fit to enter the circulating medium?

The latter difficulty will be disposed of first. How could flint be reduced to a state capable of entering into the circulation? A solution of one grain to the ounce, though assisted by the process of dialysis, was impossible, and to get it pulverized sufficiently fine seemed equally impossible; unless, to use it after an old country method, to irritate worms in their passage through the bowels, by its mechanical roughness, when a poor dog is suffering from such unfriendly visitors; but to obtain it perfectly free from grit appeared totally impossible.

At last, in the beginning of January 1869, a gentleman brought me a sample of silica, supposing I should be delighted to see the result of a new patent (which, however, proved a failure commercially). Here, pure common flint was reduced to a much finer condition of powder than even wheaten flour is reduced, and was thoroughly fit for medicinal use.

I had a present of over three pounds of this powdered flint given to me, and in this manner it was first obtained in a suitable condition for internal administration.

Would that I could as simply state how I arrived at the conclusion that flint introduced into the circulation would produce some beneficial end, as how I obtained flint in a suitable condition for administration!

All is, and ever has been, a matter of pure hypothesis, and what is worse still, it is held as an absolute fact, without the shadow of an experiment to support it, unless it should be ill-naturedly said that I had the exploded experiments of the late Dr John Brown to fall back upon, who announced to the scientific world that nitrogen was a gaseous condition of silicon; and even here some unkind friend might say that you told me your convictions were that nitrogen was a compound gas, like to carbonic acid, and was the result of the combination of hydrogen and silicon, some time before Dr

Brown's views were announced, and possibly that nickel is solidified hydrogen. But of this latter hypothesis I am by no means so decided as I am of the former, *i.e.*, that nitrogen gas is a compound of silicon and hydrogen.

It is not worth while troubling any one as to the manner in which I arrived at this conclusion. Suffice it to say that attention was directed to it when trying to solve certain difficulties in relation to flint as occurring in geological formations. Moreover, it gave a very easy solution to a difficult matter both in physics and also in chemistry. 1st, All gases sooner or later disappear by precipitation or absorption, in rainfall or otherwise, saving a certain proportion of aqueous vapour and carbonic acid gas, added to oxygen and nitrogen; these resist precipitation but recognise absorption or chemical appropriation; but nitrogen appears in its gaseous state to even refuse appropriation, yet, in its solid form, in organism, it is constantly changing by death and decomposition from the solid to the gaseous condition. The query is, How does nitrogen enter as a solid into animal or vegetable life?[1] Is it by decomposing air contained in water? This might explain the matter, but it entirely lacks demonstration. So does the hypothesis that it is soluble. Silica contained in most waters, though in a very minute quantity, uniting with hydrogen, and so becoming nitrogen, by the decomposition of water setting oxygen free, gives a very uncertain supply.

Again, granting that the electro-magnetic condition of the earth is of a given ratio of tension, and, by its active chemical influence, it secures a given ratio of oceanic atmosphere, it is not difficult to conceive, if nitrogen is a compound of silicon and hydrogen, how the proportion of oxygen and nitrogen should be so constant (the great source of variation being between carbon and oxygen), for the supply of water and silica is inexhaustible, and by mutual decomposition we should have a sufficient source of constant proportional elements for our present oceanic atmosphere.

From the foregoing it will be clearly seen that a strong hypothetic basis has led to the assumption that in silica, when suitably administered, some distinct medical property would be found to exist.

All this theory has nothing to do with how a remedy proves efficacious, which is a matter of pure observation and experience, and the scientific physician must guide the empiric into defined paths of administration, *after* sufficient experience has shown how it acts. It is a *post hoc* affair and not an *ante hoc.*

Leaving theory, we will turn to the more useful subject of practice.

Mrs B., aged 35 years, sent for me 2d January 1869. She had been suffering much pain in the pelvic region, especially over the sacral portion, for the last twelve months. Catamenia were regular, but the flow excessive, and a faint unpleasant leucorrhœal discharge at intermediate periods. Her manner was cheerful, complexion clear, but pale; tall and moderatly well fed; but the flesh was to the touch flaccid.

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[1] Ammonia, as a compound of nitrogen, is supposed to supply vegetables with that element, from ammonia being always found near the earth's surface; but recent researches upon the results of highly nitrogenous manures upon vegetation, tend to the conclusion that ammonia stimulates vital action, without aiding by its presence to increase the compounds of nitrogen.

Upon more careful examination, I found much pain over the pubic region and along the course of the broad ligaments, with enlarged inguinal glands, those of the left side being considerably larger than on the right. The labia and entrance to vagina healthy and natural, but the cervix uteri was large and lobulated, with flesh-like substance growing from the cervix and os uteri (as recognised by touch) in hard and uneven masses. Also the vagina in its upper and posterior portion felt rough.

The diagnosis was cancer. Up to the 30th of January 1869, she was treated with various remedies calculated to relieve pain, and to promote the function of digestion, which was very indifferent. Opium, belladonna, and morphia, were the chief sedatives used, all with good result for two days and then less and less effect. Three grains of morphia in fourteen hours appeared to have very little effect.

Her pain became so intense, and came on in such sudden and violent paroxysms, that she would in a moment suddenly jump from her bed to the floor, and there would roll; yet she appeared capable of enduring pain more patiently and self-possessedly than most, when not extremely intense.

On 30th January I first ordered silica in the following form:—

℞ Pulv. silicæ, gr. i.
Morph. acet., gr. ⅛
Extr. hyoscy., *q. s.* M. Fit. pil.
i. nocte maneque sumendum.

She continued the same pills, with only one week's intermission, until the day of her death, which happened on 30th June 1869. Her pains, which she described as her bad or cancer pains, ceased after the tenth day, or thereabouts, from the time of first taking them, with one exception.

Towards the end of February to the middle of May, much trouble arose from the confined state of the bowels, and frequent tenesmus, or, as she termed it, pinching pain of the bowels. Aperients were of no use, from the posterior wall of the vagina and the rectum contiguous to it being one solid mass of cancerous structure, hence enemas were constantly used. But about the middle of May she had one day of intense suffering, and the following day a large mass of cancerous substance passed per vaginam. From this time the action of the bowels was regular, but feculent matter passed in part by the vagina.

From this time she fell into pure cachexia and sank exhausted, and wasted to a shadow, but entirely free from pain. In Mrs B.'s case it will be perceived that I gave silica in combination with morphia. To this an objection was raised that the sedative effect was due to the small dose of morphia, combined with the silica; therefore, to remove all future source of error, one grain of silica with two grains of chalk and resin were formed into a lozenge, and one given night and morning. The result was exactly the same with regard to pain, but the digestive organs generally seemed to carry on their functions better without the morphia than with it.

Since Mrs B.'s case, over five years have elapsed, and many cases have been under treatment for cancer by silica. The result has been pretty uniform where the silica lozenges have been taken regularly throughout its course; namely, that from the eighth to tenth day from commencement of taking the remedy, the pain has been greatly abated, or altogether ceased; but Mrs B.'s is the only case in which free sloughing has occurred in one mass of any considerable size.

There is one very important fact to be observed of a thoroughly practical character. It is this: Supposing a patient has been taking silica for three months, and is in moderate health and free from pain, or it is reduced to a minimum, the probabilities are that a new order of thought takes possession of the mind in one of two forms. *First*, As I am free from pain I ought to get strong and healthy as formerly, but I get no stronger, and discharge, or hardness, remain as before; I will go and see some one that will get rid of it altogether; for I don't believe it is cancer. From this time the silica is of course no longer taken. *Second*, A mind will be less temperate than the one given, and will say, As it is now doing me no good, as it has freed me from pain but has done nothing else, and I get no more forward, I will let matters alone, and let it take its chance.

The probabilities are that in about two to three weeks the pain will return in its former intensity. But, so far as I have yet observed in such a case, the silica never again repeats its former power in the same degree as it possessed before it was discontinued for two or more weeks. I will give two or three cases to illustrate this peculiarity.

Mrs H., Camberwell, aged 54, had a small hard tumour, movable at the base but adherent to the integument of the left mamma, with retracted nipple. It was judged to be suspicious. In two months, or in April 1870, it became larger and more painful. She began silica treatment at this time in the usual form of lozenges, one night and morning. From this time it *very slowly* increased, or rather it remained stationary, but free from pain, or so slight as merely to attract momentary attention. Her husband died of double broncho-pneumonia towards the end of the year. Anxiety, trouble, and increased responsibilities, made her entirely forget her own personal disease; but in about two months fiom the time of ceasing the lozenges, the tumour had rapidly increased, and began to give intense pain. She saw Sir J. Paget, who judged that operation would be imprudent. The small hard tumour had become more extensive, and had, for the first time, invaded the axillary glands to an extent which led me to suggest her consulting the distinguished surgeon she did. I rarely saw her oftener than at two months' interval, but after this time I saw her once and then twice a week. After the well-marked intension of her disease, silica was taken till her decease, which happened 6th September 1871. The cancer grew rapidly, was exceedingly hard and heavy, and broke out, as is usual, into tender and spreading ulcers; and, but for the dressing, with very offensive discharge, as the slightest neglect clearly proved.

The pain was great and progressive, but scarcely so great as is usually experienced in cancer of the scirrhus type, till the last three days, when the pain was very intense. Towards the end, morphia was freely given, but apparently with the effect of rendering the patient more conscious of pain when its effects were over.

Mrs P., of Bath, widow, age 63, a stout, healthy-looking lady; abdomen presenting from a tumour which had existed for twenty years, but for the last ten years had neither increased nor decreased, and had long ago ceased to be a matter of concern; came to see me for a tumour in the left breast. It was a large irregular mass, very hard, nipple retracted and of a very dark colour compared with that of the right mamma.

Mrs P. had consulted many, but finding the pain increasing, and the tumour spreading, she could be no longer persuaded that it was a harmless tumour, especially as the nipple was so changed to that of the corresponding mamma. She was put upon silica, one grain night and morning, commencing on 31st May 1870, and died in December of the same year at Bath.

The course was exceedingly singular. My notes show that to the last of my seeing her, which was 6th December—and she died about two weeks later, from a violent cold—though the tumour alternately became more firmly fixed to the skin, and at other times less so apparently; and the nipple would get more prominent at one time and lighter-coloured, and then dark and retracted, yet it never became fixed at the base. With this alternation on the tumour of the left mamma, a small hard tumour appeared in the right breast, accompanied by slight retraction and darkening of the right nipple; but it appeared to vary in size and softness very much with the changes in the left mamma; but by the 26th of October this tumour could be no longer detected, saving by a few hardened lactiferous tubes which remained to mark the seat of the small right mammary tumour. One thing worthy of observation is, that the left mammary tumour and the glands in the axilla were always much larger and harder if Mrs P. took a cold in the head or chest.

Considering the distance from Bath, and Mrs P. rarely remaining in town above two or three weeks at a time, and when in town she only called upon me once a week, my having seen her, from

31st May to 6th December, upwards of twenty-two times, appears rather remarkable; indeed, she got so nervous that to be out of town for more than a week was quite unusual. But, strange to say, amidst all her nervousness and anxiety about her medicine, she was perpetually forgetting to send on for her medicine. The result was very trying; for, if her pain got worse, she remembered at once; but whilst she took the silica, the pain was so much less, and sometimes gone altogether, that she was in the perpetual habit of neglecting it for three or more days, and then taking it again regularly for a fortnight or more. The perpetual alternation of pain and comparative freedom from pain, or entire freedom at times, running parallel with the continuance of the silica, and its neglect for three days or a week, shows a peculiar limit between its being of great use, and its losing its power to a very considerable extent, when taken irregularly and without system. Where neither arrest of pain or development are so complete as when taken regularly or completely given up.

The abdominal tumour was to the left side, near the pubes, and ascending, of the solid form (probably fibroid). This tumour became very small by 5th October, and little could be felt when last examined, the lady being much amused at her more comely figure when she cared nothing about it.

Though an almost *fac simile* to Mrs B.'s could be given, I have preferred to introduce the singular and most unsatisfactory case of Mrs P., where no man could possibly arrive at a correct judgment, if experience from more decided perseverance had not made such uncertain action more a school for closer observation than a standpoint to measure the results in the hog-like process of mere statistics.

The two last cases cited open out a field of inquiry in two distinct directions. 1*st*, Can silica retard malignant growth? 2*d*, Has it any special effect upon fibroid tumours or solid?

My answer to the first is simply this: When I first used silica, my opinion was that it simply allayed pain without interfering with any function of the body outside nutrition and the nervous system; but several cases have presented themselves that have led me to suppose it probable that it has a very considerable retarding effect, yet in the more acute forms of medullary cancer, I have not seen any very encouraging results. But I will give two more recent cases bearing upon this point.

Mrs F. had an encephaloid tumour removed in December 1872 from the left breast; in about three weeks it began to grow again, and was, therefore, more deeply cut, but subsequently it healed soundly. In a few months after, the disease appeared in the right breast. She declined further operation, and has since then taken silicon lozenges, one night and morning. The large mass has disappeared; depression of the skin on one side of the mamma, retracted nipple, and violent pain, have likewise disappeared, and the lady herself is in apparent good health.

Miss N., aged 63, had common hard cancer, with large open running sores, the glands of the axilla large and hard, and a most unpleasant smell. Two years ago she desired to be operated upon, but was wisely declined by a distinguished hospital surgeon.

The cancer is now smaller and much improved, as is the health also. Pain from the cancer is so slight that she sleeps well, and only experiences inconvenience after lying long in one position.

Is this cure? I doubt it much; it is improvement, but I will go no further.

In speaking of the internal treatment of cancer by silica, it is right to give the external treatment likewise.

Of this I have little to say, as one lotion or injection has been employed, and only where the cancer has broken, or presented a raw surface, as of the breast or the orbital cavity; or where mucous surfaces are involved, as of the uterus and adjoining parts. It consists of the following formula:—

℞ Liq. Fowleri, ʒiss. vel ʒij.
Tinct. conii, ℥ss.
Sodæ bicarb., ℈j.
Aquæ ad ℥viij. Misce.
℥ss. omni nocte utendum.

To be used with an equal quantity of warm water, as an injection or lotion, after washing or irrigation, as the case may be. The lotion is *quite* strong enough, and it invariably destroys all unpleasant odour after a few days' use.

Of course it does not cure; but having now used it for twenty-four years, I can speak well of it as a valuable agent in the treatment of cancer.

I began to use it from an indirect remark made by a famous quack, at a time when I was making independent researches of my own. From the great local improvement which this lotion made, I was led at first to suppose it might here and there end in cure. But I am very satisfied that, for the end of cure, it ought not to be relied upon in the slightest; but it relieves pain, destroys odour, and makes the ulcerated surface healthier and cleaner.

Used every other day to chronic ulcers or fistulæ, it is extremely beneficial.

Leaving the subject of cancer, our next inquiry is, Does silica affect solid or fibroid tumours, or fatty tumours, etc.? Mrs P.'s tumour on the left side of the abdomen, which she had for twenty years, and almost stationary all that time, was hard, large, and had a particularly solid feel. This tumour, as has already been said, got very small whilst silica was being used for cancer of the breast. From its size and long duration, it was judged not to be malignant, but a solid fibroid tumour.

Mrs C., aged forty-seven years, had a large irregular tumour, stretching from the left to the right side of pelvic region, for which she had had much treatment for the last six years, and finally sought to get rid of it by operation. This alternative was refused, after which she came under my care. She took chlorate of potash in solution one year; the following year, the syrup of iodide of iron; but with no result from either. Then silicon lozenges for two years and a half, one night and morning regularly. There remains now a small hard tumour, situated near the left sacro-iliac synchondrosis. It is about the size of half a middle-sized orange, or of a large-sized hen's egg. Before silica was used, I should imagine it would have displaced water equal to about twenty fluid ounces. From its size, half smooth, lobulated surface, solid feel, its length of duration, and no glandular swellings, it was judged that the tumour was an encysted fibroid tumour.

Miss P., aged forty-three, had two tumours, one extending across the pubic region from left to right ilium; not quite so large as in the last described case, narrower towards the right extremity, but developing into a rounded mass on the left side, and apparently arising from the left ovary. It was unequally lobulated and firm, but not stony hard, neither were the inguinal glands enlarged.

The other tumour was in the left supraclavicular region, partly sinking below and behind the clavicle, and reaching inwards to the thyroid gland, but not attached to it, and perfectly movable. This latter tumour was considered by several medical men suitable for removal, but no distinguished operator would risk its many chances of failure.

Both tumours greatly diminished under the use of silica, but as the clavicular one diminished it rose high up in the neck, and as it became smaller it also became harder, and finally got impacted between the œsophagus and trachea, and produced death by starvation, all food being arrested immediately below the pharynx.

Several more cases might be given, though silica has not been tried so much for other tumours as for cancer or malignant disease.

It rarely happens that a medicine which is useful in one class of ailments will not be found to have some beneficial influence upon other diseases of a somewhat different type; as, for instance, quinine is an excellent antifebrifuge, but it is also an excellent tonic; so silica has proved useful in other affections than tumours, either malignant or innocent, as will be shortly seen.

I will now make a few remarks upon silica in diabetes. And it may be as well to remark that there is no intention here to discuss the researches of M. Claude Bernard, Drs Harley, Pavy, or M'Donnell, but, as far as possible, to state a few facts, and there end the matter.

I have as yet only seen two cases of glucosuria, or amyloids, or sugar of the liver in the urine in adults. In both these cases I was kindly assisted in the analysis by Professor Rodgers, fearing that I might possibly make some error in diagnosis.

The first gentleman had it, so far as could be traced, for little more than two months, perhaps scarcely so long, so far as marked symptoms were concerned; but from the frequent calls by night, the large amount passed, and its disproportion to what he drank, he judged that he had diabetes. He was a thin and active man, of seventy years of age, living in the country; his energies much tried in professional duties.

The urine was sp. gr. 1028, but the quantity passed was never very accurately determined. The case did well. In six weeks all indications of glycogen in the urine had gone, and the sp. gr. 1015. About a year later there was a slight relapse, which yielded to treatment as at the first.

In this case nothing particular was done, saving a careful endeavour to restore the function of the liver to its normal state, which appeared to be much deranged, and the skin had begun to assume a yellow bilious hue as well as the sclerotic of the eye.

The second case was a gentleman from Hertfordshire, aged forty-six years, of sedentary professional habits.

He had been under care for diabetes for six years; urine, upon two separate occasions, six months between each, ranged from sp. gr. 1029½ to 1028. He still attended to his usual duties, but was thin, had lost flesh, and was much depressed in spirits. The case, as before stated, was not true diabetes, but the milder affection now known as glucosuria.

I put him upon silicon lozenges, one night and morning. The result satisfied him well, as his skin was more moist, he slept better, had fewer calls by night, he felt stronger, and in six months had gained 2 lbs. in weight. Also, he felt more competent to attend to his daily duties with pleasure and cheerfulness.

N.B.—Seen a year later, and is still improving.

His diet was a little more liberal than the diabetic diet now in vogue, and to which he had been accustomed for the last six years.

This is the only case of long standing of pure glucosuria which has come under my care.

The cases of pure diabetes have been very variable, and I shall only give two or three cases to illustrate the action of silica in this disease.

Colonel L——, aged forty-eight, saw me 23d January 1871. He had had diabetes for four years. In that time, he had run down from 12 stones to 7½ stones. Had for one three months eaten raw beef. Another three months he had lived upon skim-milk. Both greatly reduced the sp. gr. of the urine, which was usually at 1040 or 1042. It came down twice to 1015 for a few days.

The fault which the Colonel had with either treatment was, that one single break in upon the treatment pursued put all the cogs of the wheel out of place, and they would not go in again, according to his own account.

He took silica in the form of lozenges for rather more than two years. Once or twice he left them off for a week or more when on the Continent, but resumed them again, as he felt the skin more pliant and moist, and less thirst whilst taking them, than by the use of any other remedy. The urine varied very slightly in sp. gr. during the whole time of treatment. Yet the wasting was much slower, almost imperceptible, till just before his dissolution; and his powers of endurance in walking or travelling were greater after taking them for some time than they had been for long.

He took an ordinary mixed diet without any apparent increase of thirst, or increase in the quantity of urine discharged, and with much more quiet and rest by night.

One result has been invariable whilst taking silica in diabetes. The skin has been moist, the thirst less intense, and the calls by night to void urine less frequent, and that without any restriction in diet with regard to fats, sugar, farinaceous, or any other kind of food or drink, saving always condemning spirits.

I have never found any direct relation, whilst taking silica, between the degree of improvement and the decrease in the sp. gr. of the urine, for instance.

Mr W., New York, U.S.A., saw me 2d October 1872. He remained in England till 26th December 1872. When he arrived he weighed 120 lbs., and when he left for America he weighed 127 lbs.

His case was a very severe one both for feverishness and disordered digestion, though he ate largely. His thirst was intense, and his skin dry and bound. The tips of his fingers felt, as he described them, as if underneath the skin they were lined with tinfoil, and his fingers as if they had been soaked in lime-water. The quantity of urine passed could never be ascertained, from his restless and shifting habits. Only he felt he "was draining to death," or "he was being dried up."

In treating him, his diet, which was very restricted, was restored to a mixed diet, was not changed in anything whatever. He became stronger, the skin moist, the thirst not so intense, the fingers assumed their natural feeling; digestion and bowels improved by alteratives, and after the first six weeks he could bear walking in the city for three hours or more without fatigue.

The improvement occurred prior to any change in sp. gr. of the urine. It was exceedingly high, ranging from 1050 to 1054. After ten weeks, it suddenly went down to sp. gr. 1040, at which point it remained till close upon the end of the year, when he left for Liverpool, but his friends have not been able to hear any tidings of him since.

One case has appeared somewhat exceptional, and is here referred to as unusual and difficult to explain. Had not Professor Rodgers carefully analyzed the first sample of water I received from him, and since then not only analyzed the urine, but personally examined the patient at his own house, I should have demurred publishing the case. But as all ordinary care has been used both by Professor

Rodgers and myself, it is here given as a pure matter of fact, without any further explanation.

Mr Baker, tradesman, 16 Warwick Street, Pimlico, aged forty-five, stature middle size, broad set, large frame, and stout, saw me 7th June 1870, at my residence. He had within two months run down 16 lbs., which greatly surprised him, and led him at once to seek professional advice. In two months longer he had lost 24 lbs. more, which made in all 40 lbs. in four months. He never got below this, but from this time he gradually increased in weight, and is now 205 lbs., or 14 st. 9 lbs., in weight; but he does not remember what his exact weight was before he suffered from diabetes, but probably 15 stones.

His symptoms when he first presented himself were excessive thirst, dry and parched mouth, with inability to get moisture in the throat and palate; a dry condition of the skin and the hands, which felt as though they had been in hot water for hours, coupled with a most unpleasant feeling at the tips of the fingers; confined bowels, with much distention and flatulence; marked prostration, and inability to attend to his usual duties without much exhaustion; the flesh flabby, and himself getting thinner.

The urine passed was large in quantity, not less than six pints by night, and by day perhaps much more, but being at market in a morning, and in his business as much as he could attend to during parts of the day, no certain measurement could be obtained. The sp. gr. of the urine varied from 1034 to 1037 during the first four months. After four months it ran down to sp. gr. 1028, and at the end of the year it was sp. gr. 1017.

Analyzed by Professor Rodgers and myself, the urine gave no trace of sugar in December 1870.

For the first three weeks I gave him chlorate of potash and perchloride of iron in mixture, but without any beneficial result. On 28th June 1870 I changed his medicine to silica, one grain, with resin and chalk, the whole made into a pill with extract of henbane; one to be taken night and morning. He took the pills for three months, when they were changed for the silicon lozenges.

By 4th July Mr B. had experienced a considerable change. He had fewer calls by night. The urine was less in quantity, thirst had ceased, the digestion was good, and he perspired freely.

Since January 1871 Mr Baker has remained in good health, is nearly as stout as ever, has no single symptom belonging to diabetes, and works as hard as any tradesman in Pimlico.

In November 1873 I saw him for varicose veins in the left leg, the result of over-standing; in all other respects he was in excellent health.

Before going further, I now wish to make a few remarks upon silica.

At first I used it in the form of pills, and to one or two poor patients I have supplied it privately as a gift, mixed with chalk, one part of silica to three parts of chalk, and then mixed in treacle, and taken in small quantities twice a day, with just the same result as when given in the form of pills or lozenges. With these exceptions the entire dispensing and preparing of the silica has been in the hands of Messrs Bradley and Bourdas, chemists, Belgrave Road; from whom I have at all times received the most kind and willing attention to anything which might be suggested or desired.

For the first three and a half years no one but myself knew what I was using. I supplied the silica mixed with precipitated chalk and resin to the firm, after preparing it myself, and the lozenges were called Compound Resin Lozenges; but in 1872 the name was changed to "Silicon Lozenges," preferring a generic term to the more precise chemical term silica. Since the new title has been given, Messrs Bradley and Bourdas have had the entire management throughout.

The recipe for the lozenges is as follows:—

℞ Pulveris silicæ, gr. i.
Pulveris resinæ,
Cretæ præcipitatæ, āā. gr. ij.
Sacchari albi,
Gummi acaciæ,
Aquæ distillatæ,
ana quantum sufficiat. Misce, et fiat trochiscus.

These lozenges are put into neat boxes, portable and well-adapted for postage, containing about thirty in each box, and of such reasonable price as well meets the necessities of the poor, one shilling and sixpence being the very low rate at which they are sold.

As silica is heavy and very insoluble, but when moist and finely powdered is prone to coalesce and cake, if it is to be continued for months, or two or three years, however small in quantity, it is well to use it in such form, as it is next to impossible for it to ever accumulate and harden in the alimentary canal. Hence a preference to lozenges has been given.

Should silicon ever be recognised as a suitable medicinal agent, more elegant forms and greater varieties will be used than its simple oxide. And no doubt, in certain forms of dyspepsia, burnt straw will form an elegant and useful form, as burnt carbon combined with silicon or silica will have its own special action.

We have the soluble salts of silicate of soda, and of potash of a fixed strength, and prepared in our laboratories; why not use these? They are not quite so manageable as at first sight appears, for when largely diluted with water they are apt to precipitate, and so to cease as soluble compounds.

I have tried the silicate of potash in one case only, and, like most of the salts of potash, it acted very unfavourably. The urine increased in two days greatly in quantity, but remained at the same sp. gr., 1034. The temperature of the body ran down after forty-eight hours from 98½ to 97, which was accompanied with shivering, coldness, and *cutis anserina*, though the weather was warm at the time. The fingers also felt as if soaked in lime-water. The lozenges had been taken for two months previously, and it was not till ten days after resuming them that the previous temperature (which was rather too high) and feelings returned to their normal standard.

I wish it to be distinctly understood that whilst using silica I have never put the slightest restraint in any matter of diet, either in cases of tumour, cancer, or diabetes, unless it has been the forbidding the use of ardent spirits, either one way or another, either in drops or pints.

If patients have already been under treatment by others, I have left them entirely to their own choice, but I have advised their rather widening than contracting the received diabetic dietary, one which, in many essential points, is closely allied to Mr Alfred Moore's dietary for reducing obesity, better known as Bantingism.

As to how silica acts, I do not pretend to distinctly say; a general impression is all that can be given. When first used, the impression was that it would possess some modifying influence over the process of nutrition of a very gradual and general character; and, moreover, that in large doses it would be of greater injury than use, or else comparatively inert. *Observation* has led me to conclude that it acts as a gentle stimulant to the spinal cord, and, probably, also, it is stimulating in a very slight degree to the corpora striata; that it strengthens muscles and makes them firmer; that its action through the spinal cord is more towards the extensor muscles; and, in diabetes, it remarkably increases the function of respiration.

Taken upon the whole, without its having any of the irritating effects of arsenic or strychime, it resembles in some points both these agents.

One word upon secrecy. To try any remedy upon such chronic and important diseases as cancer or diabetes, the by-laws of the Royal College of Physicians and the cancer ward of Middlesex Hospital give sadly too short a time, as "one year," to test the value of any remedy in curing or rather alleviating such formidable diseases as malignant and incurable complaints.

A man is certainly stupid, however sure he may feel that he has found something of real good to suffering humanity, who does not give himself moderate time for careful observation before publishing it to the world.

There remains one matter for consideration—namely, Has silica ever been used as a medicinal agent till lately? The answer to this is, That it is quite as old as the time when waters have been resorted to as possessing medicinal properties; for there are few waters which have not a *trace* of silica. But without going over a long rigmarole of names and places, two modern and very recently known springs have obtained a widespread notoriety for the cure

or alleviation of cancer, albuminuria, and diabetes. One is the Bethesda Waters of Waukesha, Wisconsin, and the other is the Missisquoi Springs, Franklin co., Vermont, both of the United States of America.

Both these waters contain silica in excess over usual springs or medicinal waters. The Bethesda waters, beside bicarbonates of lime, magnesia, soda, and neutral salts, contain 0·743, or about three-fourths, of a grain of silica to the American wine gallon.

There is a desire in the proprietors or venders of the Missisquoi waters to claim properties for them which their chemical analysis does not afford, and some attempt to palm off a mysterious agency by the assumption of some special allotrophic forms possessing distinct chemical and physical properties.[1]

I possess two analyses of these waters, but cannot say from which spring the water is obtained; for there are two or three springs used medicinally, and all within short distances from each other.

Professor Rodgers analyzed some Missisquoi water for silica alone; he found it in the proportion of 1·0780 gr. to the gallon of water, in combination with many salts, the chief being carbonates of lime and magnesia.

The other analysis has come to hand privately, in the form of a small printed slip of paper, obtained from a wholesale house, which is as follows:—

ANALYSIS OF THE MISSISQUOI SPRING WATER.

Constituents in 1000 parts of the water.

Potash	·006155	Protoxide of manganese	trace.
Soda	·010950	Chlorine	·001420
Lime	·063000	Sulphuric anhydride	·011670
Magnesia	·023420	Silicic anhydride	·016000
Protoxide of iron	·001800	Organic matter	trace.

Solid residue obtained by direct evaporation, ·191000

To this analysis of the Missisquoi waters is added, for contrast's sake, the analysis of the Bethesda waters, Wisconsin, U.S.A.

ANALYSIS OF THE BETHESDA MINERAL WATER,

by Professor C. F. Chandler, of Columbia College, N.Y.

In one U.S. wine gallon, of 231 inches, there are:—

Chloride of sodium	1,160 grains.	Phosphate of soda	a trace.
Sulphate of potassa	0,455 „	Alumina	0,122 grains.
Sulphate of sodium	0,452 „	Silica	0,741 „
Bicarbonate of lime	17,022 „	Organic matter	1,983 „
Bicarbonate of magnesia	12,388 „		
Bicarbonate of iron	0,042 „	Total	35,710 „
Bicarbonate of soda	1,256 „		

Both these waters have, for so insoluble a substance, a considerable amount of silica, with a large amount of salts, all of which have some alterative, laxative, or tonic effect; both these waters are said to cure most formidable ailments, the Bethesda curing diabetes and many minor ailments, and the Missisquoi waters curing or alleviating cancer, tumours, and albuminuria, and a host of minor diseases. Silica is in by far the largest proportion in the Missisquoi waters; but it does not appear that the Bethesda waters have been tried for cancer, nor the Missisquoi for diabetes. Though at a time when these waters when unknown in Europe, one ingredient was being tried in a tolerably pure state for tumours, diabetes, and cancer.

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[1] See "The Missisquoi Springs and their Wonderful Cures." Printed by Herrick and Son, 16 Spruce Street, New York.

The quantity, when used artificially, being two grains in the twenty-four hours, is much larger than that introduced by drinking two or more pints of these waters daily. But it must be borne in mind that iron or sulphur, taken as natural chalybeates, or alterative waters, give much greater results than the same ingredients and the same proportions prepared artificially, probably because they are more soluble and better adapted to enter into the circulation when prepared naturally than they are when prepared artificially; but however the matter is explained, about the result there can be no doubt, that a one-tenth part supplied from nature's laboratory is equal to one part prepared artificially.

Should silica be accepted as a medicinal agent, and be commonly admitted as possessing distinct medicinal properties, springs and streams possessing this agent will be resorted to with a much greater regard to its possible results than has been wont hitherto; and upon the wake of that we may expect the presence and proportion of silica, or its compounds, or silicon, will be more carefully examined, and, in many instances, the recognised existing proportions considerably altered, from the simple fact of more attention being directed to this end.

As the Missisquoi waters are said to have a great effect in albuminuria, I may mention one case in which the silicon lozenges were given with, as the quacks would say, "the same happy results" as follow the use of the waters mentioned.

Mrs S., aged forty-two, Rutlandshire, mother of five children, saw me three years ago. Her urine was loaded with albumen, and might be considered a valid case of simple albuminuria. She took the lozenges for eighteen months. I saw her twice in twelve months, at the end of which time the urine contained a very small amount of albumen. I have not seen her since, but I have heard through another patient, who has seen her, that two and a half years after my first seeing her she had given birth to a healthy child, and that she herself was strong, plump, and quite well.

But Mrs S. had a tumour on the right side, situate between the liver and the navel, and apparently growing obliquely backwards toward the right kidney. It was judged to be fibroid. At the end of twelve months it was almost imperceptible, and the patient was getting stouter and improved in strength, and, above all, in natural and undisturbed sleep.

With this general change, both in the general health and in the size of the tumour, the urine gave but a small trace of albumen, but in such a case it is difficult to determine whether silica removed the disease affecting the kidney or it only removed a constant source of local irritation, and so a diseased kidney was arrested in the progress of its onward march.

For chronic albuminuria I have for long employed as a medicinal agent the syrup of iodide of iron, with quassia or some other tonic. The result has so far satisfied me that I should be sorry to substitute silica for iodide of iron. For new remedies are called for where known remedies are a thorough and well-recognised failure; and where we are sure we do badly by using old remedies, we may do better, but scarcely worse, by trying new ones.

In the treatment of diabetes, the venders of the Bethesda waters adopt a diabetic diet to aid the efficacy of their specific, and are careful to claim a certain reduction in the sp. gr. after a month or more of trial. A lady, living in Kent, who has been for some time under my care for diabetes, was, at the time of my first seeing her, taking the Bethesda waters, and still is taking them; but as she frequently is from home, visiting friends for three or four weeks, it is inconvenient to take the waters with her, so, at such times, she takes the silicon lozenges with her, as being very portable and readily transmitted by post.

At first I was disposed to think that she was better, and had less sp. gr. in the urine under the Bethesda waters, and in all was stronger, more active, healthier, and freer from thirst; but after watching for some time, I found, after she ate all things in common, that upon an ordinary mixed diet, if there was a difference, the sp. gr. of the urine was rather less with the lozenges than with the waters, but about the same in all other respects.

But as I have before said, between improvement in health, strength, diminished thirst, free perspiration, and diminished urine, and the sp. gr., when using a mixed and ordinary diet, I have found no relation whatever; and in every case improvement has taken place in all the symptoms and in the general health, long before the sp. gr. has undergone any marked change, saving such changes of rising and falling at different times of the day, and sometimes for a week, as are common to all cases of diabetes.

ARTICLE VII.—*Notes on the Case of a Woman who Swallowed a Pint of Paraffin-Oil.* By G. R. GILRUTH, L.R.C.S.E., etc.

ON the 15th of September 1874, Mrs R., a middle-aged delicate woman, feeling herself becoming suddenly faint, seized an ordinary quart bottle, thinking, according to her statement, that it contained porter, and drank the whole of its contents, namely, a pint of paraffin-oil.

Her mistake being at once discovered, an emetic was given, causing copious vomiting; and I saw her shortly after that.

The oil was purchased on the previous night, and none of it had been used; and afterwards, on inquiring at the shop where it was bought, I was informed that a pint of the oil had been sold.

She complained of a burning sensation in the region of the stomach and in the throat; the surface of the body was cold, but the pulse was good; and the fauces, with the exception of being slightly reddened, had a natural appearance.

The treatment consisted in giving about three drachms of the bicarbonate of soda dissolved in a small basinful of warm water; ordering a hot poultice to be applied over the abdomen; and later, two drachms of the vin. ipecac. were given, but without causing more vomiting.

In the evening the patient felt little or no pain; there was no tenderness over the abdomen; the natural warmth had returned to the body, and the bowels had acted very freely.

On examining about half a teaspoonful of the oil which remained in the bottle, I found it to be a clear fluid with an odour like that of naphtha, and having a mild sweetish taste.

In the course of a few days the woman was moving about, and in her ordinary state of health.

As paraffin-oil is largely used at the present time for lighting purposes, it may not be out of place to record this case, in order to show how much may be taken internally without necessarily producing a serious result.

ARTICLE VIII.—*On the Physical Exploration of the Lungs.* By GEORGE W. BALFOUR, M.D., Physician to the Royal Infirmary.

THE great difficulty experienced by students in obtaining correct ideas of the condition of the lungs from physical exploration, depends mainly upon defective tuition. And tuition in this respect is faulty in two directions,—first, in that it makes use of expressions which have no meaning in physics, but are based on anatomy, conventionalism, or both; and, second, because too great a refinement in diagnosis is aimed at, and this leads to the adoption of terms which have no definite signification, and to which every teacher attaches his own. In the following pages, an attempt is made to simplify this tuition, and render it more exact, by employing only strictly physical terms as indicative of strictly physical conditions—terms which will be found as applicable to the investigation of all other bodies as to that of the human body, if their physical condition be similar—terms, therefore, which can never be mistaken or misunderstood. It is obvious that, to complete what we call the diagnosis of any case, it must be investigated from various points of view, and that, finally, all these different aspects must be duly considered from the standpoint of pathology, before we can arrive at any definite conclusion as to the actual nature of the disease, its present condition, or probable termination. In this completion of the diagnosis, however, physical exploration bears only a very subordinate part, and very much of the confusion and difficulty which prevails in regard to physical diagnosis has arisen from the attempts which have been made by successive teachers to employ its revelations as in themselves pathognomonic of certain diseases, instead of as only indicating certain physical conditions. Attempts which date from the time when every disease was thought to have its own special acoustic sign—a time when the jubilant eureka of Laennec was considered to be in itself a triumphant answer to the mournful wail of Baglivi, "Oh, quantum difficile est curare morbos pulmonum,—Oh, quanto difficilius eosdem cognoscere."

The methods usually employed in the physical exploration of the chest are four[1] in number, viz., Inspection, Palpation, Percussion, and Auscultation. It is with the two latter only that I propose to deal at present.

PERCUSSION is the art of ascertaining the condition of any organ of the body, as to resonance, by tapping on the surface just exterior to the part whose state we wish to examine.

What we tap with is called a *plessor*, and may be either one or two fingers of the right hand, a Winterich hammer, or the end of a stethoscope. If we tap directly on the walls of the chest, the percussion is said to be *immediate*. But percussion is less irksome for the patient, and the sounds produced are more distinct and more easily investigated if we apply some dense firm substance close to the walls of the chest and tap upon it; the percussion is then said to be *mediate*, and what we tap upon is called a *pleximeter*; this may either be a finger of the left hand, or a disk of ivory or caoutchouc. If we employ the fingers alone as plessor, we have, besides the information to be gained by the sound elicited, the advantage of perceiving the resistance of the part percussed, increase of resistance being equivalent to increase of density; but this is a matter of but small importance. In selecting a plessor and pleximeter, it is of the utmost consequence to choose those which on forcible contact give forth of themselves the least possible sound, as thus only we can avoid, as far as possible, confusing the sounds produced by the instruments employed with those resulting from the resonance of the part percussed. To an adept, this is a matter of trifling importance; to a neophyte, however, it often involves the whole question of error or accuracy in the appreciation of the sounds produced. In this respect no instruments are superior to the fingers, or to a finger of the left hand as pleximeter, and a Winterich hammer as plessor. The object of percussing is to throw the part percussed into sonorous vibrations; we must therefore tap smartly, not too forcibly, for fear of hurting the patient, but lifting the plessor quickly, lest we check the vibrations it is our object to excite.

In the estimation of the sounds produced by percussion, the only points we have to attend to are PITCH and CLANG.

The *pitch* of a sound depends upon the length of the sound-wave.

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[1] A fifth method, Succussion, can only be occasionally employed, and is also excluded from present consideration.

For an explanation of this I must refer to Tyndall on Sound, or to any of the many manuals on natural philosophy which treat of sound. According to these works, the depth of a column of air which resounds most perfectly to the note of any tuning-fork—which, therefore, most perfectly reproduces it—is exactly equal to one-fourth of the length of the sound-wave produced by the fork. And we know from experiment that this sound-wave diminishes in length as it increases in rapidity, increase in rapidity being equivalent to heightening of the pitch, as we learn from experiments on the syren. Hence the shallower any air-space the higher the pitch of the note with which it most perfectly resonates. Heightening of the pitch of the note produced by percussion is therefore significant of a diminution of the air-space beneath the part percussed. Not that there is ever any alteration in the general rapidity of the vibrations of the part percussed, because the resonance-box over which it is stretched is shallow, but simply because the air-space beneath the part percussed selects solely those vibrations with which it resonates, and makes them alone audible; precisely, as experiment shows us is the case with an air-jar, which only makes audible the vibrations of those tuning-forks the length of whose sound-wave coincides in the ratio described with the depth of the jar. And we learn from this the first important lesson in percussion, that a rise in the pitch of the percussion note indicates a diminution in the air-space beneath the part percussed. In the normal chest the second interspace in front subtends the largest air-space, which is nearly equal on both sides, and here we have produced on percussion a note of lower pitch and greater duration than on any other part of the chest, and this is the key-note to the percussion of the lungs. Whenever we have, on percussing any part of the chest, a note produced of higher pitch or shorter duration than this, or whenever the percussion note of one of these interspaces is higher or shorter in duration than that of the other, it indicates either a diminution of the air-space subtended by the part percussed, or a predominance of the clang of the part percussed over the resonance of the air-space beneath. And this leads us to the second important lesson in percussion, viz., the importance of CLANG in modifying the sounds produced.

What we call *clang* or *timbre* is that peculiar quality of sound by which we recognise the instrument producing it, so that we never mistake the noise of a drum for that of a fife, or a violin for a piano, even although the same tunes are played on them. It is acoustically referred to a mingling of the overtones or harmonics of the body giving forth the sonorous vibrations with its own fundamental note, and in percussion it therefore varies infinitely with the nature of the body thrown into sonorous vibrations. It is therefore of importance in percussing the chest to avoid, as far as possible, all sources of confusion which may be traced to clang. For this reason I have already mentioned the care which ought to be exercised in selecting a suitable plessor and pleximeter; for this reason also we must carefully avoid indiscriminately comparing the percussion note of a rib with that of an interspace; but must always compare rib with rib, and interspace with interspace. Over the sternum, clang often simulates increased resonance by a lowering of the pitch; over the shoulder-blades, clang simulates diminished resonance by a heightening of the pitch. We must therefore percuss the sternum by itself, and avoid comparing its percussion note with that of either the ribs or interspaces on either side; and for a similar reason we must, in percussing the scapular regions, compare the right scapular region with the left one, and not with any part of the chest above or below it.

A mass of fluid or of perfectly airless flesh, when percussed under conditions which are such as completely to obviate any communication of the percussional vibrations to sonorous bodies lying above or beneath them, is incapable of being thrown into sonorous vibrations, is therefore perfectly free from clang, and gives forth on percussion absolutely no sound at all. Out of the body, the nearest approach to this absolute freedom from all sound is obtained when we percuss a mass of solid flesh, six inches at least in thickness, or a perfectly full jar of any fluid, over one inch in diameter, and at least six inches in height, both placed upon a solid stone table of some inches in thickness. Upon these masses the pleximeter must be closely applied, and the only sound then produced by percussion is simply the unavoidable clang of the pleximeter when struck by the plessor. Within the body, it is obvious that similar conditions are unattainable. The percussional vibrations are always more or less communicated to the ribs or air-containing organs—the lungs, stomach, or intestines—in the neighbourhood of the part percussed; and we have their clang always mingling with that of the pleximeter, so that the absence of sound in percussing organs within the body is never so complete as in the conditions described. In the healthy body, the nearest approach to this entire absence of sound on percussion is obtained on the left side in the fourth interspace, about an inch and a half from the left edge of the sternum; and on the right side, in the fifth interspace, anywhere to the right of the right edge of the sternum. If we percuss the whole chest after the manner prescribed, carefully comparing interspace with interspace, and rib with rib, we shall find that the peculiarities of the note elicited on percussion over the parts just described, are that it is higher in pitch and shorter in duration over these parts than over any other part of the chest; and as a rule, that these conditions are usually more marked on the left side than on the right, because on the former the lung is less apt to intrude than on the latter.

In estimating the physical condition of the chest, therefore, from a consideration of the sounds obtained on percussion, we must remember that a rise in the pitch of the percussion note, with a shortening of its duration, over those parts where normally air-containing tissue alone is present, is always due to a diminution of the air-space beneath the part percussed. But we must also remember that in the normal chest the pitch varies, its rise in certain positions being solely due to the clang of the superficial parts, as over the scapulæ posteriorly; and in others, to the clang of certain airless organs, as the heart and liver, which normally encroach on the pulmonary air-space, organs which are mobile to a limited extent, and which carry their high-pitched percussion note with them, while they themselves are in their turn liable to be encroached upon by an abnormal extension of the air-containing lungs, and in this way may have the normal pitch of their percussion note lowered in varying degrees and over a varying extent. In these positions where the alteration in the pitch of the percussion note is due to the clang of superficial parts, a still further rise in its pitch and shortening of its duration may be brought about by a diminution of the air-space beneath, precisely as occurs in those parts of the chest where this form of clang is not observed; while in those parts where it is due to the clang of dense organs which are normally present there, the only possible alterations are a lowering of the pitch over the whole, or a greater or less part of the space usually occupied by the high-pitched percussion note, due to encroachment by the air-containing lung tissue; an increase of the area of the high-pitched note depending on various causes; and occasionally an alteration in its position, its area remaining nearly the same. While, therefore, we can accurately map out the surface of the chest, indicating in each part the low and prolonged or high and abbreviated character of the notes produced on percussion, it is only by having a perfect knowledge of the normal percussion sounds over every part, and of the modes in which these may be modified by the mobility of the organs, that we are enabled to determine, by an estimate of probabilities, whether a rise in pitch is due to the diminution in size of an air-space, to the clang of an airless body in a normal or abnormal situation, or to infer the cause of the lowering of the normal pitch, which may also occur in certain parts. We may remember that a normally high pitch is always symmetrical posteriorly, and anteriorly follows a certain pattern with which we ought to make ourselves familiar, while an abnormally high-pitched percussion note is only exceptionally symmetrical either in front or behind. Further, a great deal of information as to the nature of the clang in the various organs composing the thorax, and of the mode in which this modifies the percussion note in certain conditions, is yet to be obtained by careful experiment in the percussion of those organs, both in their natural position and also when removed from the body; and this has special reference to the percussing of the lungs in various conditions of inflation.

What is termed the METALLIC RINGING PERCUSSION SOUND is simply an amphoric clang, produced by the resonance of the percussion note within a cavity surrounded by dense walls. The CRACKED-POT SOUND is produced by a whiffing of air accompanying the percussion sound; it is supposed to indicate a cavity communicating with the bronchial tubes. In the flexible chest-walls of children or young people it is often produced without any cavity. It is doubtful if as yet we know all the conditions under which it may be produced; certainly I have occasionally heard it in old dense-walled chests, without any other sign of cavity being present, and in them it has occasionally disappeared without any ascertainable reason.

By AUSCULTATION we endeavour to obtain information as to the physical condition of the chest by listening to the sounds produced by the movement of the air within that cavity, or by the voice, or by the friction of the parietal and visceral pleuræ against one another.

If we listen to the breathing over a healthy chest, a soft sighing murmur alone is audible, which is louder and harsher in children than in adults. This vesicular murmur, as it is termed, with which we should make ourselves intimately acquainted, varies somewhat in every different individual—all we have to do with it is to note whether it is of an ordinary character, faint, or rough and puerile—as in children, and whether these characters are uniform over all the chest or confined to certain localities, whether its rhythm is regular or jerking, and whether the normal relation of inspiration to expiration 3 : 1 is preserved, or whether one or other is prolonged. A faint vesicular murmur indicates imperfect air movement from some cause, the nature of which we must take other means to discover. A puerile vesicular murmur heard in the adult indicates that the part of the lung over which it is heard is doing extra duty to make up for some defect elsewhere. Alterations in the rhythm and in the ratio between inspirations and expirations depend on various causes, and have merely to be noted for further inquiry.

In abnormal conditions of the lung this vesicular murmur may be replaced by one or other of two sounds. The one of most importance is what is termed *Pure Bronchial breathing:* this has the sound of the guttural *ch*, pronounced with the mouth wide open during both inspiration and expiration. This is only heard when the lung tissue is condensed round a bronchial tube of at least moderate size. Through this of course no air passes, the lung tissue beyond it being consolidated, and the peculiar sound is due to the resonance of the air within it with the blowing sound produced by the passage of the air through the trachea or the larger bronchial tubes above it. This theory is agreeable to what we know of the phenomena of resonance. It is also proved by the fact that obstruction of the affected tubes with mucus, or any interruption of their communication with those parts of the lung in which the air is in motion, is followed by total cessation of the phenomenon of bronchial breathing, which is at once restored when the obstruction is removed by coughing. If the ordinary explanation of this phenomenon by the better conduction of sound by the solidified lung were true, any mucous obstruction would tend rather to enhance the phenomenon than to annihilate it. Besides, we know from experiment, that sound is reflected and refracted like light, and passes only with difficulty and with loss instead of gain from one medium to another. The known phenomena of resonance also sufficiently explain why bronchial breathing is occasionally absent when all the conditions necessary for its production appear to be present.

Besides the vesicular, which is the normal respiratory murmur, and the bronchial breathing due to consolidation alone, we have another form of breath sound termed *indeterminate*, which is neither bronchial nor vesicular, but which may be either obscured by rattles; which it is, must be determined by a consideration of probabilities, in the estimate of which the character of the expiration, which may be vesicular or bronchial or otherwise altered in character or in its normal relation to the inspiration, and the percussion sound, are important elements.

RATTLES are sounds produced within the chest by the passage of air through fluids contained in the air-passages. They may be divided into *crepitant*, *subcrepitant*, and *consonating*. The crepitant rattle resembles the rubbing of the hair by the fingers close to the ear, or occasionally the crackling of salt when thrown in the fire; it originates in the air vesicles alone, and might be termed the vesicular rattle; it is only heard in pneumonia and in œdema of the lungs. The subcrepitant or mucous rattle may also be termed the *indeterminate* rattle; it is the bubbling sound of air passing through fluid, is free from resonance, and occurs in the bronchial tubes or in pulmonary cavities; it may be heard as a fine bubbling rattle in tubes or cavities of all sizes, but large gurgling rattles only occur in large tubes or large cavities. Such rattles are termed moist when the bubbling sound is distinct; and dry, when they resemble more the creaking of leather or snow, but no inference can be drawn from these characters, though of course from the uniform scantiness or abundance of these rattles we are permitted to conclude that their fluid cause is present in a greater or less quantity. When these indeterminate rattles occur in bronchi or cavities surrounded by dense walls, the sound produced by them is reinforced by resonance, they become *consonating* rattles, are louder, more distinct, and appear drier in character, and have the same signification as bronchial breathing. RHONCHI are dry sounds produced by the passage of air through tubes whose calibre is narrowed in any way. They are divided into *sonorous*, *sibilant*, *whistling*, and *chirping*. Sonorous rhonchi are believed to be produced by moderate narrowing of the calibre of the larger tubes; sibilant rhonchi, by a greater narrowing of the larger tubes, or a moderate narrowing of the medium-sized tubes; while whistling and chirping rhonchi depend upon narrowing of the smaller tubes. Rhonchi may be indeterminate—that is, they may arise in narrowed bronchial tubes with a normal or an abnormal condition of the lung tissue, without consonance; or they may be enhanced by resonance, and then their signification is the same as that of bronchial breathing or consonating rattles.

Auscultation of the Voice.—When a patient with healthy lungs speaks when we are auscultating his chest, only an indistinct *humming* or *buzzing sound* is heard over the greater part of the thorax; even in health, however, in certain parts, as in the interscapular region posteriorly, and over the upper part of the right lung anteriorly, particularly towards the sternal end of the clavicle, the voice sounds are louder and more distinct than elsewhere, giving rise to what is termed a *weak bronchophony*. This humming sound of the voice may be heard both in normal and in abnormal conditions of the lungs; it may be called indeterminate bronchophony. When, however, weak bronchophony is heard over other parts of the chest than those specified, it indicates an abnormal condition, the exact nature of which has to be determined by auscultation of the respiration and by percussion over the parts affected, as well as by an inquiry into the whole history of the case. One of the most important alterations is when the voice sounds are equal over the infra-clavicular regions on both sides. But the most important alteration of the voice sound is when it is heard distinctly and articulately through the stethoscope placed on any part of the chest. This is termed *Loud Bronchophony*, and has the same signification as pure bronchial breathing or consonating rattles; it is the product of the local resonance of the laryngeal voice in a column of air surrounded by dense walls. What is termed *ægophony* or the punchinello voice is simply a bronchophony loud or weak, to which a tremulous character is communicated; it may be produced in various ways, is occasionally heard in the normal chests of women and emaciated children, and is not pathognomonic of fluid effusions, being as often heard when fluid is absent as when it is present.

AMPHORIC RESONANCE, or METALLIC TINKLING, may accompany all or any of these auscultatory phenomena just described. They depend upon the clang which accompanies these sounds when resonating within a large cavity. The presence of fluid is not necessary for their production, nor does it prevent it. The metallic tinkling is simply a rise in pitch of the amphoric resonance.

The COUGH may resonate or be indeterminate, as well as the respiration or the voice, etc. Auscultation of the cough is chiefly useful, as by its means accumulations of fluid are removed, and the phenomena of resonance are thus clearly brought out, enhanced by the forcible inspiration which precedes the act of coughing. To obtain the full advantage of this, the cough should be repeated two or three times.

If the surfaces of the pleuræ are in any way roughened, a rubbing or FRICTION SOUND is produced, which may be heard only during inspiration, only during expiration, or during both. It is generally to be felt as well as heard, and is mainly to be distinguished from a rattle by this characteristic, as well as by its superficial character. It may possess any quality, from the most trifling jerking rub to the loudest continuous creaking.

Such, then, is a cursory outline of the physical exploration of the lungs, so far as regards percussion and auscultation, based upon a due consideration of the three important factors, pitch, clang, and resonance, which are alone able to convey to us correct impressions of the physical conditions by which the sounds produced in the normal chest by percussion of its exterior coverings, by the movement of the air within its contained organs, or by the voice, may be so variously modified. It is obvious that these altered physical conditions refer only to changes in density of the lung tissue, to diminution of the calibre of tubes, to the presence of fluid where there ought to be none, and to the occurrence of cavities of an abnormal size in the organs explored, but that the pathological causes of all these alterations have to be ascertained by a totally different series of investigations, and that we have finally to take the results of all these separate investigations, and, by reasoning upon them, endeavour to ascertain the probabilities in favour of their dependence upon one definite pathological cause. This constitutes our diagnosis of the case, and for this diagnosis physical signs alone are wholly inadequate.

Part Second.

REVIEWS.

On the Structure of Cancerous Tumours, and the Mode in which the Adjacent Parts are Invaded. By J. J. WOODWARD, Assistant-Surgeon, United States Army. Washington: 1873.

The Anatomy and Development of Rodent Ulcer. By J. COLLINS WARREN, M.D. Boston: 1872.

WE have now before us two pamphlets, both of which bear upon the *genesis* of morbid cells—a subject which is continually rising in interest with the advances of histological investigation.

The first pamphlet consists of a lecture by Assistant-Surgeon Woodward, delivered at Washington, 28th March 1873, and is the first of the "Toner Lectures," which have been recently instituted by the liberality of Dr John M. Toner of that city for the encouragement of scientific investigation.

The lecture is written in a very clear and methodical manner, and the author displays an excellent acquaintance with the investigations bearing upon the subject which have of late years been carried on in Germany and elsewhere. He also has evidently been at much pains to illustrate the lecture by means of a large number of microscopic preparations.

Beginning historically, the author describes the various phases of opinion regarding the genesis of cancer cells from the time of Schwann down to the present day. He recounts how Schwann's theory, that cancerous and other morbid cells arose by free-cell development in a formless blastema, was for a long time generally accepted; how it received a great impulse and development from the labours of Rokitansky; and how it was finally overthrown by the great theory of Virchow, who regarded cancer, as well as most other forms of morbid growth, as proceeding from the germination of the connective-tissue corpuscles.

The author then shows how Virchow's doctrine in its turn has, in quite recent times, been strongly assailed by the well-known discoveries of Cohnheim regarding the source of the lymph corpuscles in inflammation, and also by the elaborate investigations of Thiersch regarding the nature of epithelioma—the conclusion of Thiersch, as stated in his great work on the subject, being that the cancer cells are not produced by the connective tissue corpuscles, but are derived from the germination of the epithelial cells of the deeper and younger layers of the epidermis, and of the glandular appendages of the skin.

Following upon the work of Thiersch comes the essay of Waldeyer, who endeavours to show that all the forms of cancer have essentially the same structure as that of epithelioma, and that they all alike present "cancer cylinders," composed of epithelial cells, which have their original source in the normal epithelium.

To Waldeyer succeeds Kœster, who asserts that the cancer cylinders are in fact contained within the lumen of the natural lymphatic capillaries, from the endothelium of which they have originally sprung.

Then follow the observations of Classen, who concludes, from the examination of a case of epithelial cancer of the cornea and sclerotic, that "the cancer cylinders, and indeed all the new elements of cancerous growth, are no other than white corpuscles escaped from the bloodvessels after the fashion first pointed out by Cohnheim," and that they accumulate in the lymphatics merely because these are spaces as it were ready formed to receive them. In a second paper on the subject, Waldeyer accepts this explanation of Classen as accounting for the presence of the small-celled brood commonly found in cancer; but he disputes the assertion that the cylinders, with the longer cells contained in them, are of like origin, still continuing to regard them as invariably the result of outgrowth from normal epithelium, in accordance with the view of Thiersch.

Finally, the author goes on to show how the views of Thiersch and Waldeyer have found their strongest advocate in the great surgical pathologist, Billroth; whilst opinions akin to those of Classen, though not altogether identical with them, are supported by Rindfleisch in his well-known work on Pathological Histology.

After this short sketch of the history of the subject, the author goes on to detail his own observations regarding the structure of the various forms of cancer. He describes minutely the structure of five cases of epithelioma, chiefly of the skin, and of a considerable number of scirrhous and medullary cancers removed from the mamma, stomach, ovary, etc.; and he illustrates the subject by means of a few excellent plates taken from photo-zincographs. The conclusions which he derives from careful study of these cases are the following:

1. He believes, in accordance with the opinion of Waldeyer, Billroth, etc., that the "cancer cylinders" are not peculiar to epithelioma, but are an essential element in all cancers.

2. He notes that the cancer cylinders are generally arranged in the form of a network, which often corresponds closely to that of the natural lymphatic capillaries of the part, and he agrees with Kœster and Classen in thinking that they are produced merely by an accumulation of cells within these lymphatic vessels.

3. He proceeds to show, in accordance with previous observers, that in almost all specimens of cancer there is, besides the larger so-called cancer cells, a numerous brood of small cells, which are in fact nothing more nor less than migrated white corpuscles. These are found most abundantly at the periphery of the tumour, and wherever growth is most active, as at the extremities of the sprouting epithelial cylinders. The author, in some of his illustrations, shows how this small-celled infiltration advances as it were in the van of the cancer, the cells accumulating for the most part in the lymphatic capillaries and around the smaller bloodvessels. He notes also that the migrating corpuscles are to be found even in the midst of the epithelial cylinders, and between the cells of the *rete mucosum*, and he cites the opinion of Biesiadecki, who believes that normal epithelium grows by the continual settling down and development of these wandering cells which have found their way into the midst of it.

4. The author concludes, in agreement with Classen, that the lodgment of white corpuscles in the lymphatic capillaries is the real source of the cancer cylinders, the wandering corpuscles being, according to him, directly convertible into cancer cells. He, however, is still inclined to consider it probable enough that the cylinders may, to a certain extent, be produced by the sprouting of the normal epithelium, as described by Thiersch, although he regards this as by no means the chief source from which they spring.

This, in fact, is the chief conclusion of the paper, and the author supports both by ingenious argument and excellent pictorial illustrations; still, it would be rash to say that he has established his point. His facts will not be much disputed. There is, on the one hand, the presence of cancer cylinders in most or all cancers; and, on the other, there is a brood of wandering white corpuscles in their immediate vicinity. The question, however, is, if the latter variety of cell is convertible into the former; and to prove the affirmative, more is required than the mere juxtaposition of the two, or even the presence of individual cells which look like transition forms between the one and the other. There is still much intrinsic probability in the opinion of Waldeyer, that the cancer cells spring from the epithelium, and increase by germination, whilst the white corpuscles are present in the vicinity as the inevitable result of inflammatory irritation attendant upon the disordered nutrition of the part. The whole question must still be regarded as *sub judice;* but

with the aid of investigators so careful and painstaking as the present author evidently is, we may hope to find the problem in course of time gradually assuming a simpler aspect than it at present presents. The author adduces sufficient evidence to show, that, with further investigation, Classen's hypothesis may after all prove to be correct; for it is impossible to predict to what uses a cell, so embryonic in its type as the white corpuscle, may not be put under the guiding influence of diseased action.

The other pamphlet, regarding which we have still to say a few words, is one by Dr J. Collins Warren of New York. It is entitled, "The Anatomy and Development of Rodent Ulcer," and is the Boylston Medical Prize Essay for 1872.

Boston.

The term rodent ulcer is understood in the same sense in America as in this country. It is employed to designate a peculiarly slow and untractable form of ulceration, generally occurring upon the skin of the face, and causing in course of time great disfigurement, by its ravages upon the features. The diseases to which it is most closely analogous are, on the one hand, lupus exedens, and on the other, an ulcerating epithelioma; but it differs markedly from lupus exedens, in the fact that it rarely makes its appearance until the patient has passed the age of forty, and it differs from the ordinary ulcerating epithelioma in the absence of any tendency to excite secondary morbid growths in the lymphatic glands. The diagnosis of the ulcer is not generally difficult. As Dr Warren puts it—"Its superficial character, its raised and hardened edges, and extremely slow progress, together with the perfectly healthy appearance of the tissue immediately adjoining, serve to distinguish it from any other form of ulcer occurring on the face."

Regarding the essential nature of the rodent ulcer there are two main opinions:—First, that it is a specific form of ulceration, allied structurally to lupus, and containing in its hardened edges and base none of the epithelial elements of cancer—therefore not cancerous. This is the opinion advocated especially by Hutchinson and Paget, as based upon the results of their microscopic investigations. Secondly, it is held by others, and especially by Moore, that the rodent ulcer is cancerous; that its hardened edges do contain more or less abundant epithelial elements, and that the disease is in fact a form of epithelioma. Moore, in his monograph published in 1867, has accordingly termed the disease rodent cancer. He, however, found the epithelial element only in some cases, and in treating of the disease as a cancer he relied as much upon its clinical as its structural characters.

The result of the personal observation of the present author is to confirm the view of Moore, and to show that, if the modern process of cutting very fine sections of the tissue, after having hardened it in chromic acid, be employed, the epithelial element will probably be found in every case. The author reports five cases of rodent ulcer which he has himself carefully examined, and in all of them he finds the epithelial elements sometimes arranged in alveoli, sometimes in a continuous network. Occasionally the familiar epidermic balls of epithelioma are present, but they are as often absent, or poorly developed. Special attention is drawn to the fact that the cells are, as a rule, smaller than those of the ordinary epithelioma, and that they bear a close resemblance to those of the *rete mucosum*. The conclusions of the author, as summed up in page 36, are the following:—

"1. All those cases of rodent ulcer examined are forms of epithelial cancer.

"2. They differ from the forms of epithelial cancer, of which cancer of the lower lip is the type, in the small size of the epithelial cells.

"3. These ulcers may be divided histologically into two different groups, according to the arrangement of the cancer cells—viz., into tubular and alveolar."

With regard to the third conclusion, the author explains that the alveoli in the alveolar group appeared to be spaces intervening between the connective-tissue fibres and the walls of a vessel, whereas the tubules in the other group appeared to be merely portions of the natural lymphatic network of plasmatic canals distended with the newly-formed epithelium.

With regard to the second conclusion, the author would draw a distinct line of demarcation between two forms of skin cancer—the "small-celled," of which the rodent ulcer is the type, and the "large-celled," represented by the ordinary epithelium; and he points out that this division corresponds practically with the classification of Thiersch and Billroth, who divide skin cancers into two classes—the "flat cancers," under which they would appear to include the rodent ulcer, and the "deeply infiltrating," represented by the ordinary epithelioma. In the former, the cells are comparatively small, and resemble those of the rete mucosum; in the latter, they are of various sizes and polymorphous, many of them very large and flat, like fully developed epithelial scales. The flat or small-celled variety is exceedingly slow in growth, and the skin immediately about it appears quite healthy. It assumes the form of a shallow ulcer with slightly-raised edges, and it has little or no tendency to infect the neighbouring lymphatics. In the deeply-infiltrating variety, growth is much more rapid, the infiltration of the tissues more extensive, and the tendency to secondary infection of the lymphatic glands decidedly marked.

The remainder of the paper is taken up with an able and learned discussion regarding the development of cancer in general, the author inclining decidedly to the view according to which the epithelial elements of cancer are not mere outgrowths from the normal epithelium, but proceed directly from the wandering leucocytes, which are plentifully effused from the vessels of the part.

In summing up the results of his observations regarding the development of the cells in rodent ulcers, the author arrives at the following conclusions (page 61):—

"1. The formation of the cancer cell is preceded by an escape of the white corpuscles through the walls of the vessels, and an accumulation of similar cells in the adjoining lymphatic canals.

"2. That this is followed by an apparent transformation of these cells into cells resembling strongly the epithelium of the rete Malpighii.

"3. That the epithelium of the part affected does not appear to take an active part in the process, but may exert a certain influence on the character of the formation taking place.

"4. That the cancer cells lie in the lymphatic spaces of the connective tissues, and do not invade to any appreciable extent the lymphatic capillaries."

Discussing the question of malignancy, the author believes that its degree in a cancerous growth is dependent "chiefly on the quantity and activity of its cellular elements, on the amount of juices either *inter* or *intra* which it may contain, and on its richness in bloodvessels." He finds in the rodent ulcer that, comparing it with other cancers, the vascularity is not great, that the cells never accumulate in large masses, appear to have but little power of multiplying themselves by further proliferation, and speedily undergo retrograde changes. In all of these characters the rodent ulcer contrasts markedly with the ordinary "deeply infiltrating" or large-celled epithelioma. Hence the great difference presented by the two forms of disease in point of rapidity of growth and of general malignancy.

The paper altogether is a very able and interesting one, and it is especially of importance as contributing to throw light upon what is admittedly a knotty point in pathological anatomy—namely, the histological structure of the "rodent ulcer."

On Mycetoma, or the Fungus Disease of India. By H. VANDYKE CARTER, M.D. Lond., H. M. Indian Army. 4to. Pp. 116. With eleven Chromo-lithographic Plates. London: J. and A. Churchill: 1874.

THIS magnificent monograph is the fruit and outcome of much previous labour, and contains observations which were made long ago—some so long as fourteen years ago, by its industrious and talented author, and which have now stood the test of criticism and experience.

By *Mycetoma* is meant a tumour or swelling which results from the growth, within the textures of the human body, of a simply organized vegetable parasite.

These generally affect the foot or hand, and vary much in appearance, colour, and consistence. Of these varieties, a full classification is given.

In the first chapter, the history and description of the cases (21 in number) are carefully detailed. The second gives the signs and symptoms of the malady in its different stages; and the third, the anatomy; thus including all the local characters of the disease.

The second section treats of its general characters, such as sex, age, occupation, caste, and race, the cause, duration, and diagnosis of the disease, and its analogies with other maladies.

Its prominent features, for purposes of diagnosis and differentiation, are also given in the following Table, at page 35:—

Fungus Disease.	*Other Diseases.*
Is endemic.	Hence differs from caries, struma, cancerous, and non-malignant tumours.
Has a single local manifestation.	Hence differs from cancer, struma, leprosy.
Is much more frequent in men than in women.	Differs from cancer, struma, and to a less extent from leprosy, elephantiasis.
And during the middle period of life.	This is more marked than in struma, cancer.
Is not hereditary.	Differs from all these general affections.
Is not accompanied by fever, etc.	Differs from elephantiasis.
Or by marked local inflammation.	Differs from caries.
Or by constitutional taint.	Unlike struma, cancer.
Is very protracted in duration.	Differs hence from cancerous growths.
Excision is a cure.	Not the case in cancer, struma, leprosy.

Section III. is devoted to the prevalence in time and space of this disease, its nature, and its nomenclature.

Section IV. gives its prognosis and treatment.

Section V. its natural history, which opens up some very difficult and complicated questions of fungus growth, nomenclature, and relations.

A copious bibliographical appendix shows that Dr Carter has spared no pains both to discover, and to give credit to, the labours of his predecessors in the same field.

The large chromo-lithographs are beautifully done by M. and N. Hahnhart, from original drawings by the author.

Had space permitted, an analysis of this most valuable work might have been attempted; still, its style is so concise and well arranged, that it would be a difficult task to make it much shorter than it is. We can only recommend every one interested in Indian disease, and in the progress of scientific surgery, to read the work carefully for themselves.

The Muscles of the Human Body grouped according to their Action, with their Vascular and Nervous Supply. By C. J. MANNING, late House-Surgeon to University College Hospital; and F. H. ELLIOT, M.R.C.S.E. London: H. K. Lewis: 1874.

ALL appreciate the difference between a normal anatomical compendium and a cramming-book. The treatise in our hands is, in our opinion, capable of being transformed into one of the former character, and thereby proving of honest service not only to the student, but also to the practical surgeon; though, in its present state, it is very far from having attained that character.

The adoption of a tabular system in arranging the position and actions of muscles is attended, as we know, with considerable difficulty in execution; every attempt therefore of this kind ought to be received with due indulgence. It is in the hope, accordingly, that this little work may reappear in a second edition, and meet with universal acceptance, that we venture to make a few suggestions to the authors in the way of criticism.

First, The mode of *arrangement* of the Muscles of the Hand and of the Ankle and Foot is very complex, and to that extent faulty,—as at pages 30, 31, and 36.

Secondly, We remark *omissions*, under the head of "Muscles of Forced Inspiration," of the trapezius, rhomboidei, and levator anguli scapulæ; under the head of "Extensors of the Knee-joint," of the cruræus; under the "Extensors of the Ankle-joint," of the flexor longus digitorum and flexor longus pollicis; and, under "Interossei of the Foot," of all mention of these individual muscles and their actions. Under the head of "Masseter, Internal Pterygoid, and Temporal" muscles, their action is simply said to be "to elevate the lower jaw;" whereas they likewise carry forward, backward, and laterally, that bone—a very important indication in practical surgery. Under the head of "Vascular Supply," the superficial cervical artery is, in the list of "Corrigenda," not admitted as giving off branches to the platysma myoides; nor under "Nervous Supply" are the facial and glossopharyngeal nerves admitted as supplying the styloglossus muscle.

Thirdly, We regret to observe, that where we hoped to find at least an accurate statement of simple facts regarding the actions of muscles, many serious *inaccuracies* stand prominently forth. For instance, "both external pterygoids" are described as carrying the lower jaw "from before back," and "one external pterygoid from side to side;" whereas "both" or "one" of these triturating muscles carry the lower jaw from behind forwards, and it requires "both" of them to carry the jaw "from side to side." We might specify other errors—as occur at pages 10, 17, 25, 26, and 32—but our space forbids us to enlarge.

Lastly, We must add that there is notably *a lack* of due care in the matter of a plural term being used to express a structure in the singular number; instances of which repeatedly occur throughout twelve of the first thirteen pages of this book, beyond which point we did not look for them.

Withal, however, we trust that the Messrs Manning and Elliot's publication, *when amended*, will meet with due appreciation, and prove highly serviceable to the profession.

On Accessory Lobes of the Human Lungs. By EDWARD W. COLLINS, M.D. Reprint from Transactions of the Royal Irish Academy, Vol. XXV.

IN this paper, read before the Royal Irish Academy, Dr Collins describes the anatomical peculiarities of a case in which the right lung possessed a supplementary apical lobe. He compares it with similar cases previously reported, of which he has been able to collect seven, including those of Professor Cleland and Dr Chiene, reported in the *Journal of Anatomy*, 1869 and 1870, and discusses the probable mode of formation of the additional lobe. He agrees with Dr Cleland that it in all probability depends upon an adhesion of the lung at an early period to the thoracic wall, whereby the vena azygos, in consequence of the subsequent descent of the heart, instead of passing altogether behind the lung, comes into contact with it and notches it so as to give rise to the appearance of an additional lobe.

A Description of New Instruments for making Examinations and Applications to the Cavities of the Nose, Throat, and Ear; and a few Remarks about the Remedies that may be Administered by means of them. Illustrated by eleven Engravings. By THOMAS F. RUMBOLD, M.D. St Louis: South-western Book and Publishing Company: 1873.

IN this small work we have first a good description of seven instruments for making examinations of the cavities of the nose, throat, and ear.

Several of these are entirely the invention of the author; one, a nasal dilator, consists of two elastic hooks, one attached to each end of a piece of indiarubber webbing, long enough to pass round the head. He recommends three sizes—one for children, women, and men. They are made of indiarubber hair-pins bent into proper shape after being softened by heat over a lamp. They are placed one in each nostril, by compressing the extremities of the hooks between the thumb and forefinger. When the pressure is relaxed they extend, and thus lengthen the nasal opening perpendicularly (when the head is thrown back), and the traction of the rubber band around the head will draw the alæ widely apart, thus dilating the nasal orifice to its utmost extent. The advantage of this method over the use of Kramer's bivalve speculum for the ear (which is generally used to dilate the nostril) leaves both hands of the operator free, and is easily borne by the patient. One of Gruber's aural specula inserted into the nostril, as for the purposes of injecting or touching a polypus with chloroacetic acid, is well and easily retained by this nostril-dilator. In the examination of the pharyngo-nasal cavity, he has so constructed his pharyngeal mirror, that it can be changed to any angle antero-posteriorly or laterally; whilst to hold up the uvula he has constructed an instrument of such an ingenious nature that we must give his own description: "The uvula retractor (Fig. 2) is a tube about six inches long, one-eighth of an inch in diameter, having at one extremity an enlargement about three-sixteenths of an inch in extent, slightly funnel-shaped for the reception of the uvula. At the other extremity it is trumpet-shaped, three-quarters of an inch in diameter, and covered with sheet india-rubber. The method of employing this instrument is to apply the smaller extremity gently to the uvula, then with the thumb of the same hand press the rubber inward, expelling the air from the tube; on relaxing the pressure, the uvula is drawn into the tube about one quarter of an inch. Care should be taken not to produce great suction, as only slight traction will be necessary to lift the uvula and draw the soft palate forward, increasing the antero-posterior diameter of the pharyngo-nasal space from one quarter to one half inch. If carefully handled, patients generally do not feel the application of the instrument, and those who do notice it, say that it is much pleasanter than any form of a hook, however gently employed."

In the second part, devoted to the description of "instruments for making applications," Dr Rumbold figures and describes various kinds of spray-producers for the purpose of thoroughly cleansing the cavities of the throat and posterior nares. His catheter nasal douche we have tried and found most efficacions in cleansing the nasal cavities. By the use of the Bergson tubes, placed and their points curved and bent in all directions, he can apply solutions to different parts of the pharynx, pharyngo-nasal, and nasal cavities, as well as to the right and left eustachian tube. In the remedies, our author speaks highly of the use of bromo-chloralum as a cure for cases of ozæna. He recommends a solution—two drachms to an ounce of the bromo-chloralum added to a pint of warm water, and applied by means of the catheter nasal douche. Carbolic acid stands high in his estimation in the treatment of acute and chronic inflammations of the mucous membranes of the cavities under consideration. The following is his recipe,—carbolic acid (cryst.), twenty to forty grains; glycerine, one fluid ounce; water, seven ounces. He uses from one half to two drachms in each inflamed cavity every day, or every second day. Our author says he has found the addition of half a drachm of the tincture of aconite root to eight ounces of the carbolic acid solution, of great service in cases of pharyngitis with great pain, without much swelling or secretion. The aconite solution is only used long enough to control the pain, because of its constitutional effect. He speaks of the use of various remedies not officinal in this country, such as the geranium maculatum, a fluid extract, added to the carbolic acid solution, as making a valuable astringent.

The Function of the Eustachian Tube, in its relation to the Renewal and Density of the Air in the Tympanic Cavity, and to the Concavity of the Membrana Tympani. By THOMAS F. RUMBOLD, M.D. St Louis: 1873.

THE method of supplying air to the middle ear, the density of this air, and the cause of the uniform concavity of that portion of the membrana tympani from which is reflected the "light spot," for some time seemed to have been settled. Dr Thomas F. Rumbold calls this in question, but not without great misgivings as to his ability to establish the propositions which he gives. He differs from Toynbee, Helmholtz, Tröltsch, Hinton, Roosa, and many more. He says, "Were it not for the conviction that I have facts —all of which have been repeatedly tested during the last five years—that seem to support what I have to say, I would not presume to dispute their opinions on this subject." The propositions are:—1*st*, "That during the act of deglutition the eustachian tube is not an open passage into the tympanum." We have always found it so when the patient swallowed a mouthful of water, provided there was no mechanical obstruction. 2*d*, "That the walls of the eustachian tube are constantly in slight contact." They are always in "slight contact," but still part of the opening of the tube is pervious to air—its small superior curved portion. 3*d*, "That the air continuously permeates the eustachian tube into the tympanum, thus maintaining the normal air density." Dr Rumbold does not mention how the air gets in. 4*th*, "That the air in the normal tympanic cavity is not of equal density with that on the outside, the air in tympanum being rarefied." He states "that the act which the patients performed for the relief of their disability of hearing, abstracted air from the cavity, causing the membrane to recede inward, thereby increasing their hearing." We were anxious to know what were the indications of the manometer, both when the tympanic cavity contained "superabundant air," and at each successive act which the patient made for the abstraction of the air. 5*th*, "That one of the functions of the eustachian tube is the maintenance of this normal air density, is sustained by the evidence of the necessity of an increased concavity of the membrana tympani, in cases suffering from abnormally open eustachian tubes, for increased hearing." The "abnormally open" eustachian tubes appear of much more frequent occurrence in America than in this country. *6th*, "That the rarefied condition of the air in the tympanum is the cause of the uniform concavity of the membrana tympani; especially that portion from which the 'light spot' is reflected." In other words, the membrane is maintained in its natural concave state, not merely passively, but by a constant balance of opposing forces, its own resiliency, which would carry it outwards, the absorption of the air within the tympanum, which draws it inwards, and the yielding resistance of the tube to the entrance of air, which, in the healthy state, does not suffer the absorption within the tympanum to exceed a certain effect. We may doubt his facts, but we cannot but admire the earnest patient means he has used to get them. We commend the perusal of his work to all who take an interest in the study of the ear.

The Mutual Relations of Druggists and Physicians. By CHARLES E. BUCKINGHAM, M.D., Professor of Midwifery and Medical Jurisprudence in Harvard University. Boston: Printed by David Clapp and Son: 1874.

THIS is a reprint from the Boston Medical and Surgical Journal of 7th May 1874, of an address to the graduating class of the Massachusetts College of Pharmacy, 22d April 1874.

This is a very able "address," and contains much sound and practical advice both to druggists and physicians, which we on this side of the Atlantic would do well to ponder, and, what is more important, act up to it.

"There are relations between our profession which it is worth while to call attention to. Every man has his preference for individual members of any trade and of any profession with which he has dealings. But you have no right to turn my patients into the hands of any other medical man who chooses to send his prescription to you. I have no right to require my patients to buy drugs at any other store than that which they are accustomed to deal at, because he who keeps it is one who patronizes me. The physician who keeps a private remedy at a particular shop, which can be put up only on his order, and which no other druggist can understand, is a quack who has violated his word of honour."

The pamphlet contains some very excellent advices to druggists. "It is the druggist's duty to put up the medicine precisely as directed, or not to put it up at all. If there be anything directed which he has not, the druggist has no right to substitute anything else without consultation with the prescriber; and this, whether the articles be inert or active, whether they be costly or cheap." "Neither has the druggist the right to suggest to the purchaser that the dose prescribed is too large or too small." The pamphlet contains also some excellent remarks against "the habit which some druggists have of prescribing."

The following quotation will be read with interest by many practitioners: "Within a few years another form of quackery has come into being, believed in by many, though not in any degree by those who practise it. I speak of that class of practitioners who pretend to believe that the more you reduce the strength of a medicine, the more you increase and develop its powers; and that a millionth of a grain has more power than a grain."

We cannot conclude without one other quotation: "The drug store is not the proper place for a news-room. It is no place for unemployed physicians to gather in and talk over the political affairs of the day. It is no place for medical or other loafers behind the druggist's counter."

On the Past, Present, and Future of Therapeutics. By ROBERT FARQUHARSON, M.D., M.R.C.P.L. London: Smith, Elder, and Co.: 1874.

THE above is the title of a lecture introductory to the course of Materia Medica at St Mary's Hospital, London, by Dr Farquharson, who has been appointed Lecturer on Materia Medica at that Medical School. Dr Farquharson, in this introductory lecture, sets before us in a clear and interesting manner the "Past, Present, and Future of Therapeutics." We specially commend to all students and practitioners the following sentences:—"If you think that you will not trouble yourself much about *materia medica*, because you have heard some one say, in a hazy sort of way, that they were inclined to be sceptical regarding the uses of drugs, you will be doing yourselves a great injustice, no less than your future patients. For not only is there a good deal of sound practical knowledge of therapeutics to be acquired, but to prescribe well, and handle medicines cleverly, require, not only study, but practice. If you are wise, you will let me advise you to make yourselves thoroughly familiar with these points: study prescriptions well, look at and smell, and even taste, drugs, and try to avoid those mistakes and inaccuracies which have ruined many men. Many a good patient has been lost by receiving a thick, dirty-looking, unpalatable bottle of physic; many a man has made his fortune by a good hit in this direction; and some of the druggists' shops of this city could tell strange tales of the want of pharmaceutical knowledge possessed by many of our profession."

Annuario delle Scienze Mediche riassunto delle più importanti publicazioni dell' anno. Per i Dottori P. SCHIVARDI e G. PINI. Anno iv.–ii., 1873. Milano, Roma, Napoli, Palermo.

THIS is now the fourth year of this useful little year-book. The number of notices shows how active the editors must have been. In an undertaking of this kind it is always a difficult question what is to be mentioned, and what is to be left out? Whether to give lengthened notices of the most important observations, and miss out those of less moment, or to try to give a brief notice of everything? The editors of the Annuario have taken the last plan. They try, in fact, to give an account of everything that has been done during the year, and seem to mention most of the important books on medicine which have appeared in any European language. As the whole goes into about five hundred pages duodecimo, many important matters are passed over very rapidly. Taking up the book in this country, one naturally desires to know what has been done in Italy. The most important observations seem to be those of Pacini, upon absorption in the human body, but on turning to the page given in the index, one is told that, owing to the algebraic language which that distinguished anatomist uses, a résumé is very difficult, and the reader must go to the journal called Sperimentale for October, November, and December. We have a notice of experiments with the Eucalyptus globulus, by which it appears that this plant given internally has little power for curing intermittent fever. There is an attempt to give a list of the number of prizes which are offered for essays upon different medical subjects, and their number is something considerable. We have received a great deal of information in reading this little book, and we are glad to see that the labours of our own countrymen are not forgotten.

An Essay on the Principles of Mental Hygiene. By D. A. GORTON, M.D. Philadelphia: 1873.

LONG ago when people held opinions not in accordance with those of the majority, they had to count upon persecution in one form or another, hence it is likely that they took some pains to satisfy themselves that their heresies were well-founded before they avowed them. Nowadays it is quite the reverse. To propose to constitute society on a totally new basis, is the mark of a man who wants to attract notice; and we advise any young member of our profession who wishes to get quickly into practice in a large town, to take to some popular form of heterodoxy. He will be feebly blamed perhaps, but then he will gain the favour of a persistent and active set of agitators, who will do him more good than the orthodox will do him harm. Besides, a man who ventures to hold some antiquated notion, such as that we are responsible beings, and that our minds are not wholly composed out of the digested ingredients of our food, or that morals are not inherited tendencies implanted like the accomplishment of the retriever by the training our forefathers got in forgotten times, or that a husband should be the head of his house, or that women have not the same mental force and firmness of character of men;—if he defends these views, he is often attacked with arguments which can easily be had out of the newspapers, and which require some thought to answer. Whereas, if he adopts the fasionable novelties of the day, he requires no particular knowledge, and indeed no particular ignorance—save ignorance of human nature.

All such, who wish to despise prejudices that existed before the days of the steam-engine, ought to have Dr Gorton's book in the front row of their library. The Doctor stamps through old opinions with the easy unconcern of a cart-horse treading through a row of anthills. He passes from the bad effects of tobacco to the dignity of materialism, and from the fine theology of Gotama to the views of Miss Dodge on responsible maternity. Dr Gorton discusses so many points connected in one way or another with mental hygiene, that there are few subjects of any importance to mankind left undisturbed. He himself considers the great merit of his book is the number of quotations; and in truth there are a great many, from a great variety of authors, which show him to be a diligent reader. There is an amusing naïveté about the book, the author has a crowd of ideas, many of which he has not brought to maturity. The following seems interesting, coming from a medical man who has probably had good opportunities of observing, and goes to prove that the great amount of freedom or license claimed, and believed to be gained, by women in the Northern States of the great American Republic does not seem to make happy homes:—

> "Moreover, as a general rule, husbands and wives thus constituted without any refined love for one another, have extreme aversion to children; and if they are born to them at all, it is against their will and purpose. They did not marry to discharge the sacred offices of parentage; and no effort is spared but the manly one, to circumvent it. No artifice is left untried. Inordinate doses of poisonous emmenagogues are remorselessly swallowed. The art of the surgeon is invoked; and if the little creature, which has been so thoughtlessly endowed with a living soul, survives these assaults, it is often intensely disliked. It is, in fact, an unwelcome child! In three instances during my professional life I have attended women in confinement who were anxious that their babe should not be born alive! Two of the number actually expressed a desire to 'strangle it!'—a most melancholy experience, surely. Such wives have generally to learn to love their offspring."

This refers to a practice very common in the Northern States of America, as we have learned from private authority.

Here is a well-drawn picture of what we have been told is not uncommon in the States:—

> "A family of my acquaintance, the father and mother of which are both

moral and intellectual people, but who, mutually disliking each other, live in ceaseless contentions and mutual distrust, and have done so ever since the birth of their first child. All the children are most unhappy and discontented among themselves at home, although pleasant and contented among other children away, or alone separately. They are well-developed, fine-looking, quick-witted, and intellectual; inheriting these qualities largely from both parents. Their moral characters would certainly not disprove the position of Mr Combe. Nor are they vicious, ungenerous, sour, or mean. Yet they are mentally wanting. The fundamental defect in their mental organization is *respect and affection*. The mutual goodwill, regard, and esteem, so indispensable to the happiness, or existence even, of home, seems wanting. The impulse of each is to *get away from home aud each other;* returning only to eat and sleep; and as rarely for that purpose as consistent with convenience or necessity. Some exception to these statements should be taken in favour of the eldest child, which, generated under conditions more propitious, exhibits far more gentleness and affection, and correspondingly less waywardness and irritability. But the others inherit from their unhappy parents a large share of the combative, unsocial, and selfish passions which are so frequently exercised in their private intercourse."

"Several similar cases have come to my knowledge, where the children,—generally a large number, for such unions are usually prolific, the sexual being the chief and only admissible converse between them,—as soon as large enough to care for themselves, leave home and kindred to return as seldom as possible, or never. Like chickens, they are driven from the parental roof and care as soon as they become self-dependent and able to 'scratch' for themselves. Nor are they averse to going. Such children know little of the sacred associations of kindred and home! The moral advantages of home and social life do not exist for *them!*"

The author says that some well-meaning moralists "associate the increasing frequency of divorce, with the domestic violence and crime which are so alarmingly prevalent, as sustaining the relation of cause and sequence." Dr Gorton is of a different opinion. The primary remedy for these evils, he says, is knowledge—knowledge of ourselves. We think so too.

Materia Medica and Therapeutics. Vegetable Kingdom. By CHARLES D. F. PHILLIPS, M.D., F.R.C.S.E. London: J. and A. Churchill: 1874. Pp. 584.

THIS work is one of the most valuable contributions to the literature of materia medica which has been published for many years. The present volume deals only with the vegetable kingdom, but the author promises us succeeding volumes on the inorganic remedies, the alcohols, ethers, etc. Dr Phillips has written a book in which adequate space is given to the physiological and therapeutic action of drugs, while all superfluous parts of botanical and chemical description are omitted. The work is well abreast of the knowledge of the day. Not unfrequently the author advances original views, and states the results of his own experience. No other work in the English tongue contains so much information relative to the active ingredients of drugs, and no modern therapeutic researches of importance are overlooked. We congratulate Dr Phillips on his success as a writer, and we commend his work as being unquestionably the best on vegetable materia medica in the English language.

Retention of Urine. By ALEXANDER W. STEIN, M.D. Reprinted from the New York Medical Journal, May 1874.

FROM Dr Stein's paper we gather that he, like most of the French and American surgeons, is a believer in flexible instruments for the treatment of both retention and stricture.

In pathology he does not agree with his fellow-countryman Dr Gouley—whose excellent work on diseases of the urinary organs was lately reviewed in this Journal,—but maintains, what we consider the sound view, that the stricture is confined to the submucous tissue, and does not invade the mucous membrane, at least in most instances. Dr Stein gives some good practical hints. For example—"Sometimes catheterization is facilitated by directing the patient to make an effort at micturition while the instrument (after passing through the stricture) is being passed onward into the bladder. This manœuvre possesses the farther advantage that, separating the walls of the urethra, the chances of making a false passage behind the stricture are diminished."

Unfortunately the paper is wanting in arrangement. The author four or five times passes abruptly from the subject of retention to that of stricture and back again, without any proper connexion in the text, and somewhat to the bewilderment of the reader.

Notes of Demonstrations on Physiological Chemistry. By S. W. MOORE, Joint Demonstrator of Practical Physiology at St George's Hospital Medical School, Fellow of the Chemical Society. London: Smith, Elder, and Co. Pp. 1-58.

MR MOORE may be an excellent demonstrator of practical physiology, but he certainly has not succeeded in writing a useful book. These "notes" are so meagre as to be practically useless to any one, and we are confident they would be surpassed by those of any student a little above the average, who had attended a course of physiological chemistry in any school where this branch is taught. We do not deem it necessary to give quotations or special criticisms, because the work is so commonplace as not to deserve any. We are sorry we cannot recommend the book either for the use of the medical student or for the busy man engaged in practice. For the first, all the information it contains would not ensure a "pass" before a good examiner; for the second, it is so vague and unsatisfactory that it would waste his time to use it as a book of reference.

Part Third.

PERISCOPE.

T. v. WINNIWARTER, *The Resistance of the Vascular Walls in a Normal Condition and During Inflammation.* (Aus dem Physiol. Institute der Wiener Universität; Wiener Acad. Sitzbe, iii. Abth., bd. lxviii.)—In order to compare the capability of resistance of the vascular walls in inflamed parts with that in a normal state, v. Winniwarter inflamed the frog's mesentery with cantharides.

The animal was injected next day, and also, for the sake of comparison, a healthy one. The injection mass consisted of soluble Prussian blue and gelatine; the injection was performed by means of Hering's apparatus, with uniform pressure. The result of the seventy experiments was, that both in normal and inflamed mesenteries injection masses penetrate the wall, but so far an essential difference exists, for in inflamed parts the transudation of the injection mass is more frequent, and greater in extent, and took place after the lowest pressure applied (25 mm. mercury), whereas in the normal condition transudation was only observed when the pressure exceeded 70 mm. Corresponding results were found in another set of experiments, which were arranged so that the frogs by the hearts' action themselves pumped the injection mass into their vessels.

The experiments thus show that in inflamed mesenteries transudations are occasioned by a *vis a tergo*, which in the case of normal ones produces none; and that a *vis a tergo*, which is also able to produce them in a normal mesenterium, produces more numerous and greater ones in the inflamed. If the conclusion is thence arrived at, that inflamed vessels offer less resistance than normal ones, the fact must not be overlooked that, although the *vis a tergo* in experiments and counter experiments could be made equal, the side pressure at the seat of the transudation was not equal. In inflamed tissues, where the vessels are plugged with blood-corpuscles, the injection mass meets with a greater resistance than in normal vessels, and consequently with equal *vis a tergo* the side pressure on the spot must be greater.

In fact, one is convinced by optical demonstration that the injection mass advances less freely and easily in the vessels of inflamed mesenteries than in those of normal ones—a condition which in inflamed living vessels must affect the blood in a similar way. But when it is taken into consideration that in inflamed mesenteries, even at 25 mm. injection pressure, transudations have been observed, and in normal mesenteries only for the first time when the injection pressure exceeded 70 mm., it must be considered highly probable that the vascular wall itself, through the diseased process, has undergone an essential alteration, in consequence of which it offers less resistance to the penetration of injection masses, and of red and white corpuscles, than if in a normal condition; a result which entirely coincides with Cohnheim's latest researches.—*Centralblatt*, No. 30, 1874.

A. VOISIN AND V. HANOT, *On Two Cases of Muscular Atrophy observed in the course of General Paralysis.* (Gaz. Méd. de Paris, 1874, Nos. 11–13.)—Both of the authors' communicated cases of general paralysis of the insane are characterized by the fact that, in addition to the apoplectic attacks observed in paralytics, an atrophic condition manifested itself in certain muscular territories of the paralyzed side. Measurement and also microscopic investigation (made during life upon small pieces of harpooned muscle) most distinctly proved atrophy. Electrical experiment showed a diminished irritability of the affected muscles (for example, the flexor of the forearm, the sural muscle). One of the cases, which was, however, not submitted to dissection, was accompanied besides by a peculiar alteration of the skin (ichthyosis), and by a transient affection of the knee-joint of the paralytic left side.

The other case was submitted to dissection, and showed in the cervical portion of the spinal cord, less in the dorsal part, but more again in the region of the loins, a moderate thickening of the connective tissue in the lateral and posterior columns, but especially an alteration in the large ganglion cells of the anterior cornua. They appeared partly filled with yellow granules, partly also deprived of all or of many of their projecting processes, and assuming a more or less spherical form; in the latter, nuclei and nucleoli were scarcely to be found. The cells of the posterior cornua were intact. In the medulla oblongata the cells of the hypoglossus nucleus showed themselves altered in a manner similar to those of the anterior cornua. The diseased muscles had a yellow-reddish tinge, were easily broken, and filled with fatty grains; the sarcolemma nuclei were exuberant.—*Centralblatt*, No. 32, 1874.

O. SCHMIEDEBERG, *On the Different Action of Coffein on the Rana Temporaria and the Rana Esculenta.* (Arch. f. Experim. Pathol. u. Pharmacol., 1874, ii. 62–69.)—In the rana temporaria coffein first produces a muscular rigidity, which gradually extends from the point of application to more distant parts, without approaching a state of tetanus. On the second or third day of the poisoning, heightened reflex excitability first sets in.

In the rana esculenta, on the contrary, coffein produces violent and permanent tetanus, and only later is a certain muscular rigidity noticeable, which, however, is never so great as in the rana temporaria. In order to explain this diversity, Schmiedeberg assumes a difference between the muscular substance of the two species, and an unequal susceptibility in the spinal marrow for the poison. According to the author, muscular rigidity depends upon a process similar to the rigor mortis; it keeps pace with the subsidence of irritability. Coffein differs in this way from other muscular poisons (saponin, cyclanin), which destroy irritability without making the muscle rigid.—*Centralblatt*, No. 32, 1874.

SCHLIEP, *A Case of Direct Arterial Blood-Transfusion from Animals.* (Berlin Klin. Wochenschr., 1874, No. 3.)—In order to render possible the direct transfer of normal blood from the artery of a suitable animal into that of a human being, an apparatus was constructed which consists of a small syringe with two openings, together with indiarubber tubes, and two silver canulæ, prepared in exact imitation of the English stomach-pump. The latter, designed for introduction into the arteries, are capable of being closed up, but the piston of the human canula is also bored through sideways in the shape of a T, so that all the fluid passing towards the patient can at any moment be sent outwards by turning the piston. When the water-filled canulæ are arranged, they are joined to the 8-inch-long indiarubber tubes, which are again attached to the two openings of the water-filled syringes by means of metallic airproof close-fitting necks.

The transfusion begins with the opening of the piston of the animal canula, and with the aspiration of the animal's blood into the syringe, the contents of which are passed outwards through the side boring of the human canula, until pure arterial blood appears. The piston of the human canula is then immediately so turned that the contents of the syringes pass into the human artery.—*Centralblatt*, No. 30, 1874.

F. W. LORINSER, *Two Victims of Hydrophobia.* (Wien. Med. Wochenschr., 1874, Nos. 14 u. 15.)—The author denies the specific poisonous action of the saliva of a mad dog, and referring chiefly to the death of Professor Hermann of Prague, the history of whose illness and post-mortem examination is given, and to observations on a similar case of a girl twenty years old, declares it as his opinion that only a long-nourished and constantly-increasing fear of the outbreak of hydrophobia causes the ultimate disease, and that hydrophobia will cease to exist when it ceases to be believed in.—*Centralblatt*, No. 29, 1874.

NOTE ON THE CARBOLIC ACID MODE OF DRESSING WOUNDS (LISTER'S PROCESS), AND ON THE DEVELOPMENT OF VIBRIOS IN THE WOUNDS. By M. DEMARQUAY.—For some time past the Academy has received a number of communications on vibrios and on the effects produced by protozoa on the organism. Mr Lister of

Edinburgh, inspired by the wonderful labours of Pasteur, has devised a mode of operating and of dressing wounds, the object of which is to prevent the development of microzoa and to destroy the germs which exist in the air in the neighbourhood of the wound. Thanks to this method, this surgeon pretends to have obtained remarkable results. (*Here follows a description of the mode.*) His manner of operating has certain inconveniences. The atmosphere is unpleasant, the hands of the operator are rendered uncomfortable even for a day after the operation. The spray falling on the wound favours bleeding, and prevents a proper estimate of its amount; it makes it more difficult to stop the bleeding. (*Then follows a description of the mode of dressing the wound.*)

I have in my hospital practice performed eight serious operations after Lister's method, and have been able to compare results with reference to the progress of the wounds and the development of vibrios, with the ordinary modes of dressing used in France. The operations were—Four removals of tumours of breast, complicated with axillary glands; two castrations; one removal of a large enchondroma from parotid region; and one of a fibroplastic tumour from the abdominal wall.

The following have been the complications of these operations:—1. Four venous hæmorrhages the same day. 2. One secondary arterial hæmorrhage on the eighth day. 3. One purulent infection ending in death. It is right to mention that no accident of this kind has occurred to similar cases treated in the ordinary method.

In the eight cases, we noticed,—1. That the wounds were pale, atonic, as if struck by a stupor which delayed healing. 2. That the pus which flowed from them in abundance was serous, and contained few pus corpuscles. 3. That the carbolic acid seemed to render the blood more diffluent, delayed coagulation, and encouraged hæmorrhage. It may be asked, Was not the arterial secondary hæmorrhage the result of the dissolving action of the carbolic spray employed at each dressing?

So far as to results; now as to vibrios. Every day, or every other day, the pus was examined with the greatest care by myself and by many others well accustomed to the use of the microscope, and well acquainted with the results of Pasteur's labours. We always found vibrios, not only in Lister's dressing, but under all the other modes of dressing. Nevertheless, all the wounds have healed, except the one of the patient that died, which was one dressed after Lister's method. The result of the experiments is:—

1. That operative procedures or dressings in a hospital are powerless to prevent or arrest the development of vibrios.

2. That the presence of a certain number of these protozoa in carefully-managed wounds does not prevent their healing.—***Read at the Academy of Science***, 10th August 1874. ***Gazette Médicale de Paris***, 29th August 1874.

LAWRIE ON THE TEMPERATURE IN HEALTH.—Dr Edward Lawrie, Garrison Assistant-surgeon, Fort William, has (*Indian Medical Gazette*), with the object of obtaining a standard of the temperature in health, made four series of observations on healthy prisoners in the Presidency Jail, the regularity of whose habits, diet, and daily occupation ensured freedom from all ordinary errors. The men selected for this purpose had all, with the exception of those undergoing simple imprisonment, been in jail for more than six months, most of them for more than two years, and had never had any illness during their imprisonment. They were all in good condition, doing their work without undue fatigue, and were on the full jail diets, of which there is one for natives and another for Europeans. Before any observations were recorded several preliminary ones were made, and each individual who was finally selected was carefully examined, in order to make as sure as possible that he was in perfect health. The temperatures were taken, in every case, in the unloaded rectum, at 6 A.M., before the men went to work; again at noon, and again at 6 P.M., just before lock-up. The thermometer was kept in the rectum fully five minutes, and the same thermometer was always used for the same individual. The facts to be considered in the tables which Dr Lawrie publishes are these:—1. The temperature in all four series in the morning was practically uniform, and averaged 98·3° Fah. 2. The mid-day temperature in the first series—natives doing hard labour in the sun—was about 1·5° higher on working days than the morning temperature. 3. The mid-day temperature in the first series on Sundays, and in the other three series on working days as well as Sundays, was about 1° higher than the morning temperature. 4. The evening temperature in all four series was tolerably uniform, and averaged 99·46°. 5. As a rule, the evening temperature was higher than the temperature at mid-day. On the days, however, when the men of the first series were at work in the sun this rule was reversed, not from any alteration in their evening temperature, but owing to their mid-day temperature being decidedly and uniformly above the average. 6. The average temperatures were as follows:—

	6 A.M.	NOON.	6 P.M.
1st series,	98·13°	99·9°	99·45°
2d „	98·38	99·34	99·4
3d „	98·36	99·46	99·62
4th „	98·37	99·44	99·5
Collective average,	98·36	99·41	99·48

The conclusions warranted by the above facts appear to be—1. The uniformity of the morning temperature in natives and Europeans alike; and the unimportant variations throughout the day indicate that there is no difference between the temperature of healthy natives and Europeans in this climate. 2. On deducting ·6 from the temperature of the European prisoners, to allow for the difference between the temperature of the rectum and axilla, it is evident that there is no difference in the temperature of Europeans in this climate and at home. 3. A comparison of the temperature of the prisoners at hard labour on working days and Sundays, as also of the temperature of the same men with that of the men undergoing simple imprisonment, shows that work does not exert the effect, usually ascribed to it, of raising the temperature. 4. Mere work having been shown not to affect temperature, and all other conditions being alike, nothing remains to account for the uniform excess in the mid-day temperature on working days in series 1, save the fact that they did their work in the sun. 5. The standard temperature in health in the early morning is 98·3°, and a rise of one or two degrees takes place during the day, without indicating the existence of any morbid condition.

A NEW OPERATION FOR ANEURISM.—On Monday, 13th October, Dr R. J. Levis performed, at the Pennsylvania Hospital, an operation so novel in its conception, so plausible in its theory, and, if it turn out successful, so important in its power of saving life, that it seems worthy of editorial notice. The case was one of subclavian aneurism, involving, it is believed at least to the extent of dilatation, the innominate. Tying the artery has been thought by the surgeons who have examined the case to be of more than doubtful expediency, and Dr Levis has carried out a procedure which he tells us has long been in his mind. As every one knows, the late Charles H. Moore, surgeon to the Middlesex Hospital, conceived and put into execution the idea of introducing fine iron wire into aneurisms, to afford a nucleus about which clots should form. His practice has been followed in two cases, by Dr Donville and Mr Murray, both English surgeons. If we remember aright, in each of these instances the aorta was the artery involved, and the result was unfavourable.

Dr Levis's idea consists in the use of horse-hair, with the belief or expectation that it will offer sufficient obstacle to the blood-current to cause coagulation, and at the same time, being animal in its nature and not apt to undergo rapid decomposition, like the catgut ligature, will cause no irritation and not give rise to suppuration.

The horse-hair was introduced through a fine sharp needle canula, which was plunged into the sac. No difficulty was experienced in its introduction, and twenty-four feet nine inches of it were safely stowed away in the aneurism. In all probability this mass was driven in great part into the distal portion of the aneurism by the blood-current. Be this as it may, a marked diminution in the force of the pulsation of the aneurism and of the pulse of the wrist was at once induced. This has increased since the operation, the tumour has also gained greatly in solidity, the pain has lessened very much, and no unfavourable symptoms have resulted. As, on the other hand, the radial pulse and the aneurismal throb have never disappeared entirely, and as the dangers of suppuration of the sac are not yet past, it is too early to predict the result.—*Philadelphia Medical Journal.*

A VERY interesting case of successful treatment of an hepatic abscess is reported in the *Archives Générales de Médecine* for May 1874. The patient, a smith, aged 32, was under the care of Dr Peter at the *Hôpital Saint-Antoine.* The abscess was first punctured by M. Duplay, but, as the discharge did not flow properly through the canula of the aspirator, it was determined to open the abscess freely. This was done by caustics, as the safer plan, applied round the canula, which was left in. When the opening was sufficiently enlarged by the separation of the slough made by the caustic (Vienna paste), a drainage tube was inserted, which was removed about two months after the first operation, and the patient dismissed a few days afterwards cured.

EXCISION OF SCAPULA: CONTRIBUTION TO THE HISTORY O COMPLETE REMOVAL OF SCAPULA, WITH PRESERVATION OF THE ARM. OPERATION FOLLOWED BY SUCCESS, LASTING FIVE YEARS AND FOUR MONTHS. By Professor MICHEL of Nancy.—Under this title we find a very interesting and valuable paper. The history of the operation, and opinions for and against it, are first given, and then a series of eleven cases, in which the operation had been performed by Langenbeck, Syme (twice), Heyfelder, Jones, Hammer, Schuh, Michaux, Stephen Rogers, Schuppert, and the author.[1] The patient, who when first seen was 50 years old, had a good family history, and good health, till about five years previously. He had first a fall on the shoulder, and, secondly, was run over the same shoulder by a heavy carriage. The tumour, described as a cystic myeloid degeneration of the scapula, had obtained considerable size, was suppurating freely, and exhausting the patient.

The operation was performed by free dorsal incisions, giving complete access to the bone, sawing through the outer third of the clavicle, clearing the axillary margin of the bone; and, lastly, disarticulating the shoulder-joint. The operation lasted only ten minutes, little blood was lost, and only one artery was tied. He made a tedious, but complete recovery, and has a remarkably useful limb. From an investigation of all the eleven cases, the author comes to the following conclusions:—

1. That the operation is a beautiful application of conservative surgery. 2. That it is not so dangerous an operation as might be expected. 3. That while, as in other malignant diseases, the operation is powerless to prevent recurrence, in other cases the future results of the operation are very remarkable. 4. It should be considered a justifiable operation, for which distinct rules can be laid down, and which is not difficult to perform.—*Gazette Hebdomadaire,* 3d July.

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[1] This list is not complete, nineteen cases at least being on record.—ED. *E.M.J.*

ATROPHY OF THE OSSICULA OF THE EAR AS WELL AS OF THE MEMBRANA TYMPANI.—The membrana tympani had become so transparent, that both incuses could be seen through it with great distinctness, and careful measurements made by means of a micrometer, inserted into a speculum, showed both to be smaller than normal in all dimensions. The membrana tympani of the other ear was simply thickened, as usual in catarrhal inflammation of the middle ear. There was no diminution in diameter, either of the membrana tympani or of the tympanic cavity on the affected side.—Dr Blake, in the *New York Medical Journal*, June 1874.

EXOSTOSES OF THE EXTERNAL AUDITORY MEATUS, occurring uniformly on the exterior and interior lips of the lamina, forming the posterior wall of the passage, have been observed to occur frequently by Professor Wyman, in the crania of the Hawaiian islanders. The same growth has been noticed by Walker in the American Indians. Professor Wyman found this growth in various degrees, sometimes nearly occluding the external auditory meatus, in 6 out of 334 crania examined. The supposition is put forward, that aquatic habits may have to do with these growths.—*New York Medical Journal*, June 1874.

THE MECHANISM OF HEARING.—"With every tone sounded, every 'organ of Corti' must perform the excursions which belong to that particular tone. Although it be true that, with every note sounded, all the organs of Corti must perform the excursions belonging to that note, yet it must be remembered that the semi-gelatinous membrana tectoria, which rests upon the cilia of the hearing-cells, will likewise be obliged to perform these same excursions. Over one particular region, however, of the membrana basilaris this will not be the case—namely, in that portion where the 30 or more basilaris fibres are tuned to vibrate in sympathy with the note sounded. At this point the vibrations will be of sufficient vigour to throw off the membrana tectoria. So long, then, as that particular note is sounded, the cilia of the hearing-cells, in the region referred to, will receive a succession of taps from the membrana tectoria, or, to speak more strictly, will strike against this membrane. These blows constitute the true irritation of the auditory nerve. Wherever the blows do not take place, although the auditory nerve filaments may be agitated in a direction at right angles to their length, there no sensations of sound will be communicated to the brain."—*Prize Essay of the Alumni Association of the College of Physicians and Surgeons*, by Albert H. Buck. New York, March 1874.

A NEW PNEUMATIC AURAL SPECULUM.—Voltolini has, by an ingenious combination of Siegle's pneumatic speculum and Brunton's speculum, formed an instrument wherewith the examination of the deeper parts of the ear and operations may be more thoroughly and boldly undertaken. By cutting away the posterior segment of the membrana tympani and turning it forward over the hammer, a more perfect view of the fenestræ of the labyrinth and of the stapes is obtained. He proposes to operate with this speculum *in situ*, by introducing a knife through a slit in the funnel portion of the speculum. In performing the operation for tenotomy of the tensor tympani, he gives preference to the posterior segment of the membrana tympani as a field for the incision, since in that position the surgeon finds more room for the use of the knife. He says, however, that the most important part of the operation, viz., the cutting of the tendon, must be done unaided by the eye of the operator, who must rely upon a perfect knowledge of the anatomy of the parts concerned in the operation, and his *tactus eruditus*.—*Ein neuer Ohrenspiegel; die pneumatische Ohren-lupe*, R. Voltolini, *Monatschrift für Ohrenheilkunde*, vii. 2, 1873, and 5.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By W. Handsel Griffiths, Ph.D., L.R.C.P. Ed., Licentiate of the Royal College of Surgeons of Edinburgh; Librarian to the Royal College of Surgeons in Ireland; Honorary Member of the Ontario College of Pharmacy, etc.

[The author of these Reports will be glad to receive any books, pamphlets, or papers relating to Materia Medica or Therapeutics. They may be forwarded through the agencies of the *Edinburgh Medical Journal*.]

On the Action of Nitrite of Amyl.—This agent, which was discovered in 1844 by Balard, is made by the action of nitric acid on amylic alcohol. A *résumé* of the mode of preparation recommended by Veyrieres is given in the *London Medical Record*, 3d June. Nitrite of amyl when inhaled in doses of two drops causes acceleration of the pulse and flushing of the face—effects which are transitory. It has been employed as a therapeutic agent in angina pectoris, in cases of asystole, lipothymia, etc.

On the Mode of Action of the Iodide and Bromide of Mercury.—In a communication by Professor Bellini, read before the Medico-Physical Society of Florence, and published in *L'Imparziale*, 2d March, he points out, as the results of his experiments on rabbits, that the iodides and bromides of mercury are converted into double salts in the intestinal canal, and that it is as such double salts that they act. Sulphur and the alkaline hyposulphites paralyze the action of the bromide and iodide of mercury; while richly-seasoned diet, milk, the alkaline iodides, bromides and sulphites, and ammonia and its salts, increase their action.

Hypodermic Injection of Quinine in Typhoid Fever.—The following is the formula adopted by Dr Ravicini (*Rivista Clinica di Bologna*, Jan.):—Five grammes of sulphate of quinine are dissolved in fifty grammes of distilled water, and ten centigrammes of hydrochlorate of morphia are added. Of this solution he gives two injections, each of eighty-five centigrammes; two others at noon, and two in the evening. He keeps the patient under the influence of the medicine for several days. Nearly all his patients were convalescent at the end of the second week, or, at most, of the third.—*Lond. Med. Record*, 27th May.

RHAMUS FRANGULA.—This substance is the subject of an interesting paper in the *Chemist and Druggist*, 15th June, by Mr Joseph Ince. The rhamus frangula is a non-drastic, safe, pleasant, and efficient purgative.

SALICINE IN CHRONIC DIARRHŒA.—Mattison gives it successfully, in doses of five grains, every four hours to adults.—*Lond. Med. Record.*

THE ACTION OF SAPONIN.—This is a glucoside occurring in many plants of the Sileneæ, Polygalaceæ, Spireæ, and Sapotaceæ. It is a white amorphous powder, soluble in water, with a neutral reaction and sweetish taste. Its local anæsthetic effects were first discovered by Pelikan, and Köhler has recently written a monograph relative to it, which is reviewed in the *Berliner Klinische Wochenschrift*, No. 27, and is noticed at some length by Dr W. Bathurst Woodman, in the *Lond. Med. Record*, 4th Feb. The *Journal de Thérapeutique* (No. 3) also contains a notice of Köhler's researches. That experimentalist finds that all the organs into which it has been introduced, either directly or by the medium of the circulation, are seized with paralysis in a greater or less degree. It seems to act on all parts of the economy.

THE ACTION OF SALTS OF SODA AND ALLIED BASES INTRODUCED INTO THE BLOOD.—Dr Blake communicates a paper on this subject to the *Journal of Anatomy and Physiology* for June. The salts used were nitrates of soda and silver, sulphates of lithia and thallium, and chlorides of cæsium and rubidium. If injected into the jugular vein, they arrest the passage of blood through the lungs, and diminish the blood-pressure in the arteries. They all kill by their action on the lungs. Cæsium alone exercises any direct effect in the functions of the nervous system. All of them, except silver, readily pass through the systemic capillaries, notwithstanding that they so powerfully contract the pulmonary capillaries. Arrest of the pulmonary circulation may be due either to contractions of the pulmonary capillaries or to changes in the shape of the corpuscles. Much larger quantities can be introduced into the arteries than into the veins without causing death.

ACTION OF SPARTEIN.—Dr T. Lauder Brunton gives in the *Lond. Med. Record*, 4th Feb., a summary of the results arrived at by J. Fick, and published in the *Archiv. für experimentellen Pathologie* *und Pharmacologie*, vol. i. p. 397. Spartein acts somewhat similarly to conia, differing from it in constitution by having two equivalents less of hydrogen. It is a narcotic, but even in complete poisoning, entire loss of consciousness does not ensue. It acts powerfully on the spinal cord and lessens reflex action. It paralyzes motor nerves, and a small dose of it completely paralyzes the vagus. In large doses it paralyzes the inhibitory centres in the heart itself. It appears to cause death in mammals, by paralyzing the respiratory centre.

CHLORHYDRATE OF TRIMETHYLAMINE IN THE TREATMENT OF ACUTE ARTICULAR RHEUMATISM.—Among some of the latest writers on this subject are Martineau (*Soc. de Thér.*, 28th Jan.), Peltier (*Progrès Méd.* 1873-74), and Thermes (*Revue Méd.*, March 1874). All three authors speak in high terms of the efficacy of this drug in the treatment of acute articular rheumatism. It acts as a slight stimulant to the skin and as an astringent to the mucous membrane. It is a sedative to the nervous system and a hyposthenic to the arterial system; it, moreover, diminishes the amount of urea in the urine.

THE GENERAL THERAPEUTICS OF THE NERVOUS SYSTEM.—In our *Report* for September we gave an abstract of the first part of an interesting lecture on this subject by Dr E. C. Seguin, published in the *New York Medical Record.* We now propose to give a summary of the concluding portion of the lecture. Bromide of potassium is enumerated among the *spinal depressants.* It lowers the activity of the motor tract (though in a less degree than conium), and diminishes reflex excitability. Its use is consequently indicated in all affections in which reflex action is abnormally great. In various forms of convulsions, the eclamptic attacks of children and of pregnant and parturient women, bromide of potassium does good. Morbid excitement of the lumbar part of the spinal cord, as evidenced by nymphomania and satyriasis, is often relieved by it, and some forms of vomiting and spasmodic states of various sphincters may be cured by it. With regard to its use in epilepsy, the generally received opinion is that in the majority of cases the frequency and severity of the seizures are very much diminished while the medicine is being taken (the symptoms soon reappearing if it be discontinued), and that a case here and there may be cured by its use. The following rules should be observed in the treatment of epilepsy by bromide of potassium:—Enough bromide should be given to reduce the reflex function and keep it below the normal standard; a diminution or abolition of the reflex movements of the palate and fauces will serve as an indication of the diminution of reflex excitability. More of the medicine should be given at night than in the day time. It should be given in a perfectly continuous way for months or years. A few epileptics cannot tolerate the bromides, and become easily "bromized." While recognising the great value of Brown-Séquard's compound bromide solution (bromides of potassium and ammonium and iodide of potassium), Seguin more commonly employs a simple solution of bromide of potassium, giving five grains three times a day, and fifteen grains or ℈j. at bed-time, at first, in adults. Children require relatively very large doses of the bromides. Seguin sees in anæmia no contraindication to the use of the remedy, nor does he believe that any law can be laid down for giving or withholding it from observations upon the retinal circulation. Such a view is based only upon the more than doubtful physiological theory that cerebral hyperæmia and anæmia are usually prime factors in the pathological state called epileptic.

Restoratives. — Dr Seguin accepts Headland's definition of "restoratives," viz., those remedies which restore to the system an element diminished by disease, or whose diminution causes a disease. Of this class phosphorus and fats are chiefly useful in diseases of the nervous system. In many of those nervous diseases in which much phosphorus is excreted, the administration of phosphorus is attended with much benefit. It should be borne in mind that some organisms are very susceptible to the toxic influence of phosphorus. In cerebral malnutrition, in "spinal irritation," in hysteria, and in varieties of paralysis, this drug is of the highest value.

Among the nervine *tonics* are enumerated strychnia, arsenic, zinc, iron, quinia, and cold. Strychnia in cases of irritablity, of hysteria, spinal irritation, and in some palsies, may be given in small doses ($\frac{1}{40}$ to $\frac{1}{32}$ grain) for long periods of time. The action of arsenic is often marvellous in chorea, and very satisfactory in other nervous diseases. The oxide and lactate of zinc have been much used in states of exhaustion of the nervous system, after sexual excess, or in chronic alcoholism, and in epilepsy. Seguin refers to two so-called specific modes of medication: viz., the treatment of morbid states of the nervous system due to tertiary syphilis, by iodide of potassium, in daily doses of from ʒi. to ʒvi., until improvement takes place; and the treatment of malarial neuralgia by the hypodermic injection of quinine over the affected nerve. Dr Seguin concludes a very comprehensive and valuable lecture by referring at some length to the use of *counter-irritants*, *electricity*, and *hygienic means* in the treatment of nervous affections. For his remarks on these subjects we must refer our readers to the original paper.

THE INFLUENCE OF ANÆSTHETICS ON THE VASO-MOTOR CENTRES.—The following is the conclusion deduced by Dr H. P. Bowditch and Charles S. Minot:—" While ether and chloroform resemble each other in their effect on those nervous centres whose activity is connected with the conscious perception of pain, the latter acts much more strongly than the former upon those centres which regulate the arterial blood-tension, and thus affects profoundly the conditions of animal life."—*Boston Med. and Surg. Journal*, 21st May.

THE ACTION OF ANÆSTHETICS ON THE RED CORPUSCLES OF THE BLOOD.—The *Brit. Med. Jl.*, 5th Sep., contains an abstract of an important article on this subject published by Professor Hüter in the *Deutsche Zeitschrift für Chirurgie.* "It is already known that many poisons, even those which do not act directly as blood-poisons, produce changes in the blood-corpuscles, and hence it may be supposed that they first produce changes in the form of the corpuscles, then globular stasis, and thus mechanically and indirectly lead to further changes. In experiments on frogs, it was very remarkable that all the agents which induced globular stasis also acted as anæsthetics; this is attributed by Hüter to the formation of embola of red corpuscles in the brain. In this way he explains the action of anæsthetics such as chloroform, ether, and alcohol, the anæsthetic power of which is in proportion to the amount of change of form which they are capable of producing in the red corpuscles. The corpuscles of chloroformed rabbits showed very irregular forms: a notched contour, frequently with one or two large club-shaped processes. After anæsthesia with ether, the corpuscles were mulberry-shaped. After alcohol, there were only very slight indentations, and these could be observed in the stage following intoxication both in rabbits and in man. It follows from these observations that the administration of chloroform by inhalation is bad, as in this way the blood-corpuscles are altered while in the lungs, and globular stasis may be produced in these organs." . . . "If Hüter's explanation of the cause of the anæsthetic action of the substances mentioned be correct, nearly everything which produces globular stasis must also be capable of producing anæsthesia by the formation of globular embolism in the brain." . . . "The researches referred to are also of practical value with regard to the use of carbolic acid. It appears that the application of this is proper only in the first stages of the treatment of wounds. After the formation of granules has taken place, it produces permanent stasis of the corpuscles in their vessels, and thus hinders the growth of the granulations as well as the formation of epidermis."

THE USE OF PHOSPHORUS IN MEDICINE. — The following is the mode of procedure for making phosphorus pills, indicated by Mr Huskisson Adrian in a paper communicated to the *Chemist and Druggist*, August:— Solid paraffin is worked up into a stiff paste with ether in a mortar; any required quantity of phosphorus is added, and well mixed with the paraffin. Should the phosphorus show signs of oxidation during the process, a few drops more ether will check it at once. The addition of a little powdered vegetable charcoal materially assists the minute division of the phosphorus, and also renders the pill-mass firmer. Finally, beat the mass to about 80° F., by placing the mortar on warm water, roll the pills, and varnish as usual. If the pills be not made for immediate use, let them be kept in a well-corked bottle in which is placed a piece of cotton-wool moistened with essence of lemon.

THE ACTION OF STRYCHNIA.—We have taken the following extracts from Dr Lauder Brunton's summary in the *London Medical Record*, 12th August, of F. A. Falck's researches (*Volkmann's Sammlung Klinischer Vorträge*, No. 69). Strychnia is absorbed, and acts most quickly when injected into the blood, more slowly from the subcutaneous cellular tissue, rectum, and conjunctiva, and more slowly still from the stomach. Absorption will occur through the lymphatics, even when all the vessels of the part to which it is applied have been carefully ligatured. It is often supposed to be absorbed from the bladder, but, according to the author's experiments, this is not the case. . . . . The symptoms of strychnia-poisoning in man are, first, quickened respiration, and, afterwards, convulsions of a tetanic character. Sometimes there are general convulsions, but no tetanus. The shortest time in which tetanus has occurred is five minutes, and death in ten. The longest time is tetanus in two and a half hours, and death in six. In regard to the action of strychnia on the simple organs, it has been found that it does not paralyze the inhibitory centres of Setschenow; it stimulates the vaso-motor centre, causing contraction of the arteries and increased blood-pressure; it renders the olfactory and optic nerves more sensitive, increasing the sense of smell and the sharpness of vision, as well as enlarging the field of vision for blue and red. In poisonous doses, it produces hyperæsthesia of the retina in dogs. The pupil is dilated to its maximum during the tetanic convulsions, and is normal in the intervals. Strychnia has little action on the heart. It lessens the power of the blood to absorb oxygen. It slightly raises the temperature of the body. It causes contraction of the spleen, and acts on that organ through the splanchnics. It is said to increase the secretion of urine. When given to a pregnant animal it exerts but little action on the fœtus in utero. According to the author, the common idea that strychnia acts primarily on the spinal cord is erroneous. On the contrary, it acts primarily on the brain, its action being exerted on the vaso-motor centre; on the inhibitory centre for the heart; on the respiratory centre so powerfully, that the irritation is propagated from this to the whole system of voluntary muscles; and, lastly, on the reflex apparatus of the spinal cord. These actions excite secondary reflex stimuli starting from the spinal cord and associating themselves with the central ones. After this has lasted some time, the blood becomes poor in oxygen, and this deficiency of itself acts somewhat like strychnia, and the poisoned animals die of asphyxia. The largest fatal dose of strychnia is four milligrammes of the nitrate in a child, and between fifteen and thirty of the sulphate in an adult. . . . . Frogs require a larger dose than mammals, instead of being much more susceptible to its action as is generally supposed. All salts of strychnia have almost exactly the same action. After reviewing all the remedies hitherto proposed for poisoning by strychnia, the author concludes that the treatment, if convulsions have not set in, is to empty the stomach by emetics or the stomach-pump, to wash it out with decoction of galls, and combat the convulsions by chloroform. If convulsions have already begun, chloroform must be given at once, and the intestinal canal emptied afterwards.

THE USE OF STRYCHNIA IN EPILEPSY.—In a pamphlet published by Mr Walter Tyrrell of Malvern, that gentleman contends that the immediate seat of epilepsy, and indeed of all convulsions, is situate in the medulla oblongata; that the causes of epilepsy are twofold—predisposing and exciting; that the predisposing may be divided into *Asthenic*, which consists of deficient nervous power in the medulla oblongata, and the *Sthenic*, in which the irritation overcomes the natural power of the medulla and forces on a convulsion. The exciting causes are nervous irritation of any part, more frequently of branches of pneumogastric and special nerves, and changes of the circulation either in quantity or quality. With regard to treatment, Mr Tyrrell is of opinion that strychnia is suitable in all *Asthenic* cases, the exciting causes being treated at the same time with suitable remedies. Cases are cited in support of the proposed treatment.

THERAPEUTIC ACTION OF THE ALKALOIDS OF OPIUM.—M. Laborde (*Bull. de Thér.*, 30th Dec. 1873, and *Jl. des Conn. Méd.*, No. 4, 1874) agrees with C. Bernard in attributing to morphia, narceia, and conia alone the sedative and soporific effects of opium. Codeia is liable to act in a cumulative manner. Narceia is preferable to morphia on account of its comparative harmlessness; it induces a quiet sleep which is not followed by headache or nausea. Laborde is of opinion that narceia is pre-eminently applicable to children; in the treatment of hooping-cough especially he finds it of great value, as it invariably mitigates the nocturnal fits of coughing.

HYPODERMIC INJECTION OF ERGOTIN IN PURPURA HÆMORRHAGICA.—Dr W. L. Lane records a severe case of purpura hæmorrhagica complicated with typhoid fever, successfully treated by hypodermic injection of ergotin. Dr Lane is of opinion that purpura hæmorrhagica is a disease of the capillaries, and not a malady the result of a deficient amount of fibrine in the blood, for the blood of purpuric patients coagulates as firmly as that of healthy patients. He injected one grain of the liquid extract at a time. After the first injection, the hæmorrhage was diminished, and after the second injection, it was completely arrested.—*British Medical Journal*, 5th Sept.

NOVEL USE OF THE GALVANO-CAUTERY.—A child, æt. 7, had a bean fixed at the far end of the meatus auditorius externus. All the usual means of extraction had been tried in vain, and the foreign body still remained solidly fixed between the tympanum and the lower wall of the passage, when M. Voltolini thought of trying the galvanic cautery. At a single séance, the foreign body was burnt at twenty different points, by the use of a small pointed cautery. In a day or two, the remains of the bean, reduced to one half its former size, presented itself at the orifice of the meatus, from which it was easily removed.—*Journal de Médecine et de Chirurgie Pratiques*, July 1874.

VILLATES MIXTURE.—For injection of old sinuses, especially if leading to carious bone, also as a wash in chronic otorrhœa. The following is the formula:—

℞ Liquoris plumbi subacetatis, .	℥i.
Zinci sulphatis crystal.,	
Cupri sulphatis crystal., . .	āā ℥ss.
Aceti vini albi, ...	℥viss.

Dissolve the salts in the vinegar, and add the subacetate of lead. Shake before using.—*Dr Hopkins, quoted from New Orleans Medical and Surgical Journal, in Philadelphia Reporter*, 25th July 1874.

Two very interesting cases of apparent death from chloroform, and recovery under treatment by inversion, are recorded in the *British Medical Journal* for 23d August. The first case, under the care of Sir John Rose Cormack, was that of a female aged 27, "weak, anæmic, and hysterical." The operation was for the removal of a necrosed piece of bone from the femur. The first alarming symptom was "irregularity and sinking of the pulse." Still, "the lips were red, and the face had neither a ghastly nor a pale aspect." As death seemed imminent, the patient was at once inverted for about four or five minutes. The pulse improved at once. On being replaced on the table, unconsciousness returned after a few minutes. Inversion was repeated, and with good results, the patient remaining better for about an hour. Inversion was again required, and again produced happy results; but a tendency to unconsciousness remained, which "state went on gradually diminishing in intensity; but three days and three nights had elapsed before it had entirely passed away." The second case, under the care of Dr Marion Sims, occurred in 1861. The chloroform was given to enable Dr Sims to operate for a vesico-vaginal fistula. The pulse and breathing became affected after about forty minutes. When both stopped, inversion was employed at once. The inverted position was maintained for fifteen or twenty minutes "before there was any manifestation of returning life." On placing atient on the table, "the moment the body was placed hori- ly the pulse and breathing instantly ceased. Quick as ht, the body was again inverted;" "the same tedious, painful, protracted, and anxious efforts were made as before," "till feeble signs of returning life eventually made their appearance." But "the moment the body was laid in the horizontal position again, the respiration ceased a third time, the pulse was gone, and she looked the perfect picture of death." Inversion was again had recourse to, and "she was held in the vertical position till she, in a manner, recovered semi-consciousness, opened her eyes, looked wildly around, and asked what was the matter." The patient had no further relapse.

These cases are very graphically written, and are well worth reading. They illustrate very well what is called Nélaton's method of treating "chloroform narcosis." It is a mechanical treatment, founded on a mechanical theory, and it seems to be a very painful process, both for operators and for patient. We hope, therefore, never to require to put it in practice. At the risk of being thought unbelieving, we would add, that we do not think the elaborate process necessary, and are quite convinced that the simple act of pulling forward the tongue, with the addition of artificial respiration, would most likely effect all that is necessary in such cases as the above.

Part Fourth.

MEDICAL NEWS.

Dr Arthur Jacob, M.D. Edin.—Jacob of Dublin, who died in his 85th year on Monday 31st Sept., was one of those who not only delighted in work, but were able to do constant, hard, and valuable work for a long term of years.

An original investigator; a great teacher; a laborious editor; devoted to the interest of his college, of which he was thrice president—he had succeeded during his prolonged life in doing the work of half-a-dozen ordinary men.

He has left in his own city and country a reputation for talent, honour, industry, combined with a modesty and self-negation, which will keep his memory green for many generations.

Royal College of Surgeons, Edinburgh.—At the annual meeting of this College on 31st October, the following office-bearers were elected for the ensuing year:—*President*—Dr James Simson. *Treasurer*—Dr John Gairdner. *Secretary*—Dr Robert Omond. *Librarian*—Dr Archibald Inglis. *President's Council*—Dr James S. Combe, Dr Andrew Wood, Dr James Dunsmure, William Walker, Dr Henry D. Littlejohn, Dr Patrick H. Watson. *Ex Off.*—Dr John Gairdner. *Examiners*—Dr Archibald Inglis, Dr James Dunsmure, Dr Peter David Handyside, Dr James D. Gillespie, Dr Henry D. Littlejohn, Dr Patrick H. Watson, Dr David Wilson, Dr John Smith, Dr Argyll Robertson, Dr Joseph Bell, Mr Thomas

Annandale, Dr William Stephenson. *Assessors*—William Brown, James Spence, Dr John Gairdner, William Walker. *Conservator of Museum*—Dr James Bell Pettigrew. *Clerk*—James Robertson. *Officer*—John Dickie. *Assistant to Conservator*—James Grandison.

M. LAVAL, Surgeon-major of Hospitals in Algeria, was in a district attacked by the plague during his leave. He voluntarily went to the assistance of the terrified natives, and, the only European and only doctor in the district, was lavish of his labours, and manifested the greatest zeal and devotion in attending to the patients and endeavouring to limit the infection. His efforts were to a great extent successful in this, but after fifteen days' incessant labour, he caught the infection, and died, showing to the last the greatest bravery, calmness, and self-forgetfulness. The Minister of War, by a special order of the day, tells the army of the noble conduct of this army-surgeon, a worthy representative of the traditionary devotion which has maintained so highly the honour of the medical department of the army.—*Journal de Médecine et Chirurgie Pratiques*, October 1874.

HOW TO CHOOSE A DOCTOR.—The following advertisement appears in *L'Avenir du Gers:* —"A good doctor of medicine is wanted at Vic-Feusenzac (Gers). He must belong to the Republican party. This party, which is very numerous, will give him a very fine position. No one need apply who defends the Man of Sedan. Republican journals are requested to repeat this advertisement."

This is a warning to those who do not share in the political opinions, without which it is impossible to take a good medical practice at Gers.—*Revue de Thérapeutique*, No. 18, 1874.

CHAIR OF PHYSIOLOGY IN THE UNIVERSITY OF EDINBURGH.—The vacancy caused by the retirement of Professor Bennett has been filled up by the election of Professor Rutherford of King's College, London.

EXTRA-ACADEMICAL LECTURERS.—In the School of Medicine, the following gentlemen begin to lecture this winter:—Dr Coghill, on General Pathology; Dr J. G. M'Kendrick, lately Professor Bennett's assistant, on Physiology; and Dr Andrew Smart, on State Medicine and Hygiene.

CORRESPONDENCE.

To the Editor of the Edinburgh Medical Journal.

MY DEAR SIR,—I send you a few remarks (hurriedly written) on the article by the *Old Practitioner* on the system of examination. I have no wish to enter into the general question. I mean to restrict myself to University Graduation, and specially the department of Natural Science. In the first place, I have to remark that a degree of M.D. is higher than a diploma, mainly in the fact that the *preliminary* and *scientific* requirements are, or ought to be, higher. The degree is not a mere qualification to practise, but is a University *honour*. It is not essential for practice, and no one need take it, unless he chooses to assume a higher position than a mere practitioner. We look to our graduates as men who are to advance *science*, and who, in many cases, are to be the leaders in scientific expeditions.

A general statement is made in the article to the effect that in our examinations we demand the *whole range of* science without *limitation*. This is not true as regards Botany in this University; for it is expressly restricted in the systematic department, which is the most difficult. Moreover, other departments of the science are omitted.

Again, I think that the idea of examining on books, as recommended by your correspondent, is absurd. I am averse to all questions to be answered from books. I desire a *practical examination* on actual objects placed before the candidates, without reference to books. Hence I lay more stress upon a practical oral examination than on a written one. I think that a candidate should be able to dissect any plant placed before him, to tell its parts, their relation, and the principles on which plants are classified. These are the questions put in the oral examination on Botany in the University of Edinburgh.

Such an examination excludes all cramming; whereas a mere book examination would be nothing but a cram. We do not ask for a high qualification in Botany. We demand much less than is required in our *class examinations*. If a student cannot examine a plant which he never saw before, and give some opinion on it, and description of it, what is the use of teaching at all?

I am no advocate for mere lectures. I conduct my course in a great measure by *demonstrations* and *examinations;* and I am quite sure that an Edinburgh student of Botany will bear comparison with any in the kingdom.

As to our large volumes, it should be borne in mind that a great part of a botanical *class-book* is occupied with *woodcuts;* and, moreover, in each division there is a brief analysis, which gives all the important facts in short compass.

In these remarks, I simply want to defend myself and the Professors of the Medical Sciences from the imputations cast on them by your *Old Examiner*. I have been an Examiner in different Schools ever since 1841, and I know well the capabilities of students, and the mode of bringing out their knowledge. I also desire to stand up for the *honour* of a University degree, and not to put it on the same level as the diploma of a College. If I wanted a man to be chosen for an important scientific position, I would select a graduate of the University of Edinburgh.

Look at the number of students who spend their time in the Botanic Garden and Museum during the summer and autumn,

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*The Morisonian Lectures, delivered before the Royal College of Physicians of Edinburgh: Session* 1874. By J. BATTY TUKE, F.R.C.P.E., F.R.S.E.

LECTURE II. (*delivered 20th March.*)

Blood Supply.

WE now pass to the important and interesting study of the blood supply of the convolutions, taking it up at the point where it is left in systematic books on anatomy. Such works state generally, that the minute branches of the anterior, middle, and posterior cerebral arteries, after ramifying in the pia mater, pass into the brain substance; but we will now inquire in what manner and form they pass in and terminate.

This diagram but feebly represents the appearances shown by the brilliant preparation which stands on the table. It is one made by Dr Carter from the brain of a rabbit, into the arteries of which he injected a coloured solution of gelatine. The portion of this specimen, which is figured in the diagram,[1] magnified × 100, is the bottom of a sulcus. The eye will appreciate at a glance the fact, that there is a most manifest difference between the quantity of vessels supplied to the gray and the white matter; and closer observation will show that this is due to their size, length, and distribution.

This preparation (one of many hundreds that Dr Carter has made) demonstrates two anatomical facts:—

1st, That there are three distinct series of cerebral capillaries.

2d, That the ultimate distribution of these capillaries varies in the gray and white matter.

You will observe the transverse section of an artery at the bottom of the sulcus, from which spring branches to the right and left, which course round the periphery of the convolution external to its substance. From these smaller branches are given off, which enter the brain substance at right angles to the plane of the convolution. These arteries are various in size and distribution, and may be divided into the *large* or *medullary arteries*, and the *medium* and *small cortical* arteries; the first supplying the white substance, the two latter the gray. The large or medullary arteries run right through the cortical substance, rarely, if ever, supplying to it more than one small twig; as soon as they reach the white substance, they divide dichotomously to the right and left in the plane of the inner horizontal fibres—of course at right angles to the direction of the parent vessel. In the white matter they form a comparatively coarse capillary meshwork; this is due to the large divergent branches being connected by short annectant vessels at somewhat wide intervals. The mesh may be stated to be five times longer than it is broad. This appears to be the general arrangement of the capillaries of the white substance.

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[1] See Bucknill and Tuke's Psychological Medicine, Plate IX., Fig. 1, p. 614.

It will next be observed that there are medium-sized vessels, about twice as numerous as the large. These run directly (giving off a few twigs in their course) to the *inner* layers of gray matter, where they branch off in every direction and at *acute* angles, and then we have the smaller and most numerous arteries, whose duty seems to be the nutrition of the outer layers of gray matter. The cortical arterioles anastomose most freely with each other, but *they are terminal vessels in the gray matter.* Their anastomosis is procured by a much less definite arrangement than that of the white matter arterioles, as they simply divide and subdivide, casting off branchlets upwards and outwards—in fact, in every direction but downwards. I think the arrangement of these three sets of vessels can best be compared to that of a close forest. We have first the straight undergrowth, the branchlets of which mix with the branches of the half-grown trees; the branches of which again are overtopped by the lower ones of the giants of the forest.

The anastomosis of the cerebral arteries is most intimate. In the pia mater we have one anastomotic system, which is continued as the branches from its vessels penetrate the actual brain substance. In the pia mater lobe is connected with lobe, in the gray matter convolution with convolution, in the medullary substance all the inner aspects of the brain maintain mutual relations. The close anastomosis which is so evident to the naked eye between the external arteries becomes increased as they reach their ultimate ramification—in fact, it may be said that there is no ultimate ramification of a cerebral artery, in that it meets its fellow somewhere or other, until they conjointly merge into the venous capillary. Where the artery ends and the vein begins, we are in the same doubt as in other organs of the body.

Along with Dr M'Kendrick I have endeavoured, by simultaneous injection of artery and vein, under equal pressure, to elucidate this point in anatomy. At the present moment we do not feel justified in generalizing on the results of our experiments, but I trust that next session something definite may be laid before you.

I ask you to remark for one moment the difference between the *direction* of the supplies of blood to the white and gray matter. To the white it is by ever-recurring right angles:—the original vessel of the pia mater sends off its branch at a right angle, which again at the same degree transmits its branches to the brain substance, which, thirdly, decussate in a similar manner, which, fourthly, communicate with each other by annectant capillaries at an angle of 90°. The arteries of the gray matter, on the other hand, proceed, after the first rectangular branching, directly to the parts to be supplied, throwing off branches at acute angles, and in every possible direction.

This explains the immensely greater blood supply to the gray matter as compared with the white, which may be roughly stated to be as five to one. Although physicists are agreed that direction does not retard the amount or rapidity of the flow of fluids in *rigid* tubes, I am not aware that they have come to the same conclusion as regards elastic ones. The hypothesis may therefore be thrown out, that the constant recurrence of right angles on the arteries of the white matter *may* have an influence in modifying the amount of blood supplied to that part. However that may be, we have an absolute certainty of the greater vascularity of the gray over the medullary matter; and, arguing from all analogy, what better argument could we have that its functions are of the higher order?

It has been for long taught that the vessels which enter the convolutions are accompanied or supported by the pia mater, or, to speak more accurately, by projection of its inner flocculent surface, the *tomentum cerebri.* But it appears to me, that this teaching is more the result of argument by analogy than of actual demonstration. In fact, in none of the British standard works on anatomy is the pia mater, which is said to accompany the vessels, enumerated amongst their coats, or spoken of as a sheath, the reader being left to the belief that the outer fibrous coat of the artery and the cerebral substance are in direct apposition. In Germany it seems to be admitted that there is a coat outside the outer fibrous coat. Rindfleisch says "that although the arteries of the brain are usually said to enter naked, it would be inexcusable in any one familiar with the morbid anatomy of that organ to overlook the sheath of connective tissue, which, however slender, surrounds its arteries."

I present to you now a series of preparations which seem to me to demonstrate the existence of a coat intervening between the outer fibrous coat and the cerebral substance. Three of these are taken from the brain of one person who had been the subject of senile insanity, and who died from exhaustion and old age. On post-mortem examination no disease of heart or kidneys was found to exist. The pia mater was thickened and adherent. The other morbid appearances need not be alluded to, as they have no bearing on the point at issue. Specimens of the brain were hardened in chromic acid, and the sections were cleared with turpentine and set up in Canada balsam diluted with turpentine; glycerine or acetic acid were not used. The first of the three is a transverse section of the lower part of the medulla, near the decussation of the pyramids. In the anterior median fissure a vessel of considerable size can be seen entering, accompanied by pia mater; at a certain point, the vessel, the muscular coats of which are much thickened, is cut off short, but the empty sheath runs inwards for a considerable distance, becoming thinner and thinner, less and less fibrous in appearance, until it is lost in the substance of the medulla as a fine translucent hyaline membrane, shrivelled longitudinally, and therefore apparently somewhat fibroid. In the second section,[1] which is taken from one of the convolutions bounding the fissure of Rolando at the vertex, a similar vessel and membrane are visible, the latter distinctly pronounced in the degree to which it had arrived at its innermost portion in the first section, viz., the hyaline condition. It is $\frac{1}{150}$th of an inch thick, and is traceable almost through the cortical substance and beyond the inner cut end of the vessel. In the third preparation, taken from the same convolution, there exists in a longitudinal section of a vascular canal, in which no trace of ordinary vascular tissue can be detected, a very fine, somewhat puckered, translucent membrane, non-fibrous and non-fenestrated, filling up the space almost from side to side and from end to end; its edges are well defined; it is not coloured by carmine. I could have produced many more preparations illustrative of this condition of the vessels, but prefer to take my stand on those made from this individual case for the following reasons:—1st, That the sections were not prepared with glycerine or acetic acid. 2d, That the same appearances are noticeable in different portions of the same brain. 3d, That the external pia mater was much thickened. 4th, Because the thickened conditions of the other coats of the vessels was such as to render their demonstration peculiarly easy; and therefore enabling the eye to determine their relation.

I present to you one other preparation. It has been taken from the fresh brain, and is unprepared by any chemical agent, except cold water. The vessel was carefully dissected out from the centrum ovale, and cleaned with camel's-hair brushes, water only being used. Around it you will see a loosely enveloping sheath apart from the outer fibrous coat, forming at the bifurcations a triangular sac.[2]

Judging from my own experience, and from the study of that of others, I can see no reason why we should not regard this membrane as the extension inwards of the pia mater, and therefore as a normal investment of the minute cerebral arteries. I would not have dwelt so long on this pia-matral investment were it not that the fact of its absence or presence has very important bearings on the next question at issue, viz., the cerebral lymphatics.

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[1] See Bucknill and Tuke's Psychological Medicine (3d edition), Plate IX., Fig. 3.

[2] Loc. cit., Fig. 2.

When we consider the immense vascularity of the brain, the multiplicity and activity of its functions, its consequent constantly called-for supply of nutrient plasm, and its consequent rapid waste of tissue, we will at once see of what paramount importance it is to the study of its pathology that we should arrive at some conclusion as to the means it possesses for relieving itself of superabundant material and the products of waste. I believe that on this one point hinges the explanation of the causation of the majority of cases of insanity, and that it has important bearings on the pathology of coma, convulsions, and other allied cerebral symptoms. At present, I will confine myself to the anatomical question of the locality of the cerebral lymphatics, as its physiological and pathological bearings fall to be considered under the head of the influences inducing and producing insanity.

Fohmann and Arnold first described the pia mater as possessing an extensive system of lymphatics—an opinion which has been endorsed by subsequent observers. These lymphatics are said to be in direct communication with what is called the *great epicerebral lymph space* or cavity, which is stated to lie below the pia mater, between that membrane and the brain. It is said to have been proved that such a communication exists, as the epicerebral lymph space has been filled by injection from the true lymphatics of the pia mater. Up to the time of Robin, no communication had been shown between the interior of the brain and this space. He, in 1853, subsequently in 1855, and in full detail in 1859, demonstrated that this communication was established by means of lymphatics which followed in the course of the bloodvessels; which, shortly after, His believed he succeeded in injecting from the lymphatics of the neck; according to Eberth, however, he has lately resiled from this position. The subject has been well worked at since by Obersteiner, Roth, and Boll, from whose papers and those of the authors already mentioned this description is mainly taken. These lymph spaces not only follow the course of the vessels, but they actually surround them, and were at first in consequence called perivascular *canals*. The term canal is now abandoned, and perivascular *space* adopted, for reasons which will presently be mentioned. In most sections of cerebral tissue cut transversely to the direction of its vessels, their cut ends will be seen surrounded by a clear ring of unoccupied space, and occasionally fine trabeculæ will be found running between the outer apparent coat and the brain substance. This clear space is, to some extent, due to retraction of the cerebral tissues, consequent on the use of hardening agents; but in diseased brains, as we will see further on in the course, it is also the result of hyperæmic dilatation during life. Considerable confusion has arisen from these clear rings, *which are* *not the lymph canals of the brain.* I trust I have demonstrated to your satisfaction that there exists a sacculated coat outside the outer fibrous coat, which separates it from the brain substance; for between it, the so-called hyaline membrane or sheath of pia mater, and the outer fibrous coat is the space which is held to be a lymph space by the German authors. This sheath can be traced for a long distance loosely enveloping the vessels until (according to certain German observers) it debouches along with them into the epicerebral cavity by funnel-shaped mouths. According to Boll, the inner surface of the sheath is quite smooth, the outer rough or shaggy (zottig), holding connective-tissue, or, as they are called, after their first describer, Deiter's cells, their rough or shaggy projections communicating with the cerebral substance as if for the support of the sheath. It is believed that the superabundant plasm of the blood exudes into these lymph spaces by a process of exosmosis in the case of the arteries, and that the waste products are got rid of in a similar manner by the veins, at least to a considerable extent; for Obersteiner goes still further, for he holds that by certain "spur-like" processes there is maintained a lymphatic communication between spaces surrounding each nerve-cell and the perivascular lymph spaces.[1] This most careful observer states that he has actually thrown injections into spaces surrounding the cells; and, moreover, that he has seen lymph corpuscles in these spaces. In my own preparations of diseased brains, I have frequently found large clear spaces around the cells, and also in healthy animals, such as the ape; but I am not able to substantiate his position further than this. Obersteiner's theory is a most attractive one, for it gives us a passage by which the products of the waste of very active structures can be got rid of, and passed into the waste-pipe. I am not aware, however, of any confirmation of his observations.

I need not remind you that the brain is not singular in possessing perivascular lymphatics; for, according to Macgillivray, they exist around certain of the vessels of the liver; according to E. B. Kiber and Tomsa, around those of the spleen; and according to Dr Goodfellow, a similar relation exists in the cornea.

It is obvious of what vast importance it is to the pathology of the brain to establish the existence of a lymphatic system in it. In this country, little or nothing has been done in this direction, but in Germany it is held to be an absolutely proved anatomical fact. I propose, during the coming summer, to endeavour to inject these spaces from the lymphatics of the neck; for it appears to me that the method adopted by German authors, with the exception of His, who, as I have said, has resiled from the position, is not entirely satisfactory; they use the "einstick methode," which consists of driving injections under the pia mater, or into the substance of the brain, and allowing them to flow in every and any direction. Doubtless this method has served to demonstrate perivascular lymphatics in other organs, and as the results obtained from it are fully accepted by such authorities as Stricker, Rindfleisch, and Von Recklinghausen, we are justified in generalizing on the probable pathological results of cerebral conditions interfering with the action of these lymph spaces.

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[1] "Wien Stzb. d. k. Akad. Wissener," Bd. LXI., 1 Abth., Jan. 1871.

But I must confess to not understanding how these lymph spaces can communicate by funnel-like openings with the epicerebral lymph space which is said to lie between the pia mater and the brain matter. This to my idea is simply impossible. I have never seen any indication of the existence of an epicerebral space, and when we reflect that the surface of the pia mater is flocculent as it is applied to the convolutions, it would seem that its attachment must be intimate. On the other hand, I have frequently seen in morbid brains strong indications that there is a space between the two fibrous layers of pia mater; that, in fact, that membrane should be described as consisting of three layers,—an outer and inner fibrous, and a middle or vascular and possibly lymphatic layer. In the preparation, of which this diagram is a representation, such an arrangement can be seen most distinctly; and in this we see the funnel-like opening debouching actually into the middle, not into a space subjacent to the inner layer. If these spaces surrounding the vessels, between their outer fibrous coat and their sheath, are lymphatics, which I think is highly probable, they *must* communicate with the actual lymph passages of the pia mater. How can we believe in a space corresponding to the so-called epicerebral space in connexion with the spinal cord, where the pia mater is so very closely adherent to its substance, dipping into it, and holding it firmly together? It is only in disease that it becomes separated, and that its supporting influence on the entering arteries becomes impaired. Demonstration, analogy, and argument are all opposed to the existence of an epicerebral lymph space, as existing between the naked convolution and the pia mater; on the contrary, they converge to the establishment of the proper lymphatics of that membrane being the receptacles and conduits for the removal of the products of waste.

Interstitial Matter.

Maintaining and supporting the nerve fibres and cells and the bloodvessels in their position, holding all together as a matrix, we have a plasm called the neuroglia, or nerve glue or cement. There exists a difference of opinion as to whether this neuroglia is to be regarded as the connective tissue of the brain or a nervous structure. It would take up too much time to enter here fully upon this discussion; I will only say that the weight of argument bears upon the theory of Virchow and Kölliker, that the neuroglia is connective tissue. It consists of an intensely fine reticulated tissue, holding a clear homogeneous protoplasm (which after death becomes slightly molecular) and numerous nucleated bodies. In certain positions, and more especially in diseased brains, connective tissue cells can be demonstrated; they are spider-like in form, and are called, after Deiter, Deiter's cells—why, I can hardly understand, for their presence was indicated by Virchow in the first edition of his Cellular Pathology. Scattered in considerable quantity throughout the substance of the neuroglia are nucleated bodies, the nuclei of the neuroglia; these are finely granular, with nucleoli, and present the appearance shown in this diagram, which is an enlarged copy of a plate in Paget's Pathology.[1]

I will not dwell longer on this brain element, all-important as it is; I will only ask you to regard it as the jelly-like matrix which holds *in situ* all the other more highly organized structures. Like all connective tissues, it plays a most important part in morbid processes, being subject to changes in quantity and quality, and to pathological alterations of its cells and nuclei.

As the cerebro-spinal fluid will claim especial attention when we come to the pathological conditions of the brain, I only allude to it now as an important item amongst the brain elements.

And now, Gentlemen, I trust you will not think that I have been too prolix on the anatomical part of my subject. Detail was inevitable, for if there had not been laid before you facts connected with the normal histology of the brain, it would have been impossible to demonstrate the changes which take place in the several tissues. Before leaving the subject, allow me to lay before you Bucknill's theorem: *that we have a right to presuppose that, in the brain as in the other organs of the body, the normal exercise of function is dependent on a perfect maintenance of the anatomical relations of the component structures.* And this is most especially true in the case of the brain, for two reasons. The first is, the extremely intricate relations which its various structures maintain one with the other; we have three systems of fibres, the radiating, the horizontal, and the commissural, keeping up communication between convolution and convolution, between lobe and lobe, and between hemisphere and hemisphere—we have cell communicating with cell, cell connected with fibre, and vessel with vessel;[2] in a word, it is the organ of the body which, in its histological associations, forms the most perfect whole. It is a perfect dual organ. The second reason is that it is, so to speak, self-contained. It cannot, like the lungs or liver, cast any of its functions on other organs; it can gain no relief in disease from vicarious aid; it must do its own work, rid itself of its effete matter, and of the products of injury or disease, and provide within itself for the resumption of functions, the exercise of which have become impaired from whatever cause. The bearing which these facts have on the pathological position is—1st, *That circumscribed lesions may affect the whole encephalon temporarily or permanently;* and, 2dly, *That permanent loss of function of one hemisphere may be supplemented by the action of the opposite hemisphere.*

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[1] Page 113.

[2] It is not maintained that the anastomosis of vessels extends to a direct communication between the hemispheres; only as regards the lobes of each hemisphere.

This latter consideration leads us naturally to the question: What are the functions of the hemispherical ganglia, and what light has modern research thrown upon it?

We were all educated in the faith, founded on the observations of such physiologists as Majendie, Longet, and Matteucci, that the cortical substance was the organ through which the highest manifestations of intelligence were alone produced, that it possessed no sensibility, and in no manner subserved the inferior functions of nerve force. Brown-Séquard even could not evolve from his extensive experiments that in it were seats of definitely localized function. But within the last few years a new school has sprung up, the apostles of which are Broca, Hughlings Jackson, Fritsch, and Hitzig, Nothnagel, Gudden, and last, though by no means least, David Ferrier. The theory of this school is, that in the cortical substance of the gray matter of certain convolutions, and in certain parts of convolutions, exist psycho-motor centres—that is to say, that in certain circumscribed tracts ideas are stimulated which prompt, or produce, or excite certain definite and distinct sets of muscles to action.

Fritsch and Hitzig were the first to demonstrate the fact that the gray matter *is* susceptible to irritation—the only wonder is that this fact lay so long in obscurity. They also showed that irritation gave rise to muscular action on the side of the body opposite to that of the hemisphere irritated, and they likewise were able to produce certain of their movements definitely. These physiologists, however, stopped short at this point. But Ferrier, independently of them, and with other objects in view, took up the investigation, and by a long series of experiments, conducted in the highest scientific spirit, has evolved results which will make his name historical in the annals of physiology.

As the accuracy of Ferrier's observations has been lately impugned by a former pupil of Brown-Séquard, Dr Eugène Dupuy, I think it advisable to narrate shortly what I and other Fellows of this College have seen of them.

Early in August of last year I accompanied Dr Ferrier to the Brown Institute at Lambeth, in order to see him prepare two animals, a monkey and a cat, for demonstration to an audience, amongst whom were Virchow, Liebreich, and Burdon Sanderson. With the rapid skill of an experienced surgeon, he reflected the scalp and removed the calvarium of both the animals, arresting the hæmorrhage by pledgets of cotton-wool steeped in perchloride of iron (the animals were fully under the influence of chloroform). The dura mater was removed, and the subjects were left for two hours to overcome the shock of the operation. The monkey very soon recovered, and showed no indications of *malaise;* on the contrary, within an hour and a half of the operation he partook of milk and bread-and-butter from the hand of the operator, jumped on his shoulder, and played with him. The cat could not be trusted.

At the appointed hour a considerable audience was assembled, and Dr Ferrier, without any previous experimentation, proceeded to his demonstration; and in this wise: Holding the monkey in his left arm, utterly unrestrained, he said to the assembled crowd of observers:—"Gentlemen, I am going to touch with the electrode this portion of the brain of this monkey, on which he will open his mouth and protrude his tongue:"—the electrode was applied, the mouth opened, and the tongue was protruded. Next, Dr Ferrier indicated the spots which, when stimulated, would be followed by extension or retraction of the paws on the opposite side of the body, retraction of the ear, rotation of the head, movements of the eyes, clutching movements of the paws, and so on. Each prediction was made with the utmost confidence, and with good reason; for in every instance the result followed with the utmost exactitude, until stimulation became complicated, and epilepsy was produced; but a short interval of rest sufficed for the renewal of the demonstration. Dr Dupuy states that he has failed in obtaining the same results as Ferrier: this must be due to some imperfection in his method. For instance, he says that he has never succeeded in procuring opening of the mouth and protrusion of the tongue: now this very result Ferrier produced with the utmost certainty more than a dozen times on the occasion alluded to. Although by no means at one with Ferrier as to the explanation of the phenomena he has demonstrated, I can vouch for the absolute accuracy of his statements *as to fact* in every particular.

One important fact elucidated by these experiments is, that functional hyperæmia is produced on the application of the stimulus. I ask you to bear this in mind, as bearing on future remarks.

I must refer you to the original paper for full details, and will enumerate now only such as have special bearing on our subject. These are:—

1. The anterior portions of the cerebral hemispheres are the chief centres of voluntary motion, and the active outward manifestation of intelligence.

2. The individual convolutions are separate and distinct centres; and in certain definite groups are localized the centres for the various movements of the eyelids, the face, the mouth, tongue, ear, neck, hand, and foot.

3. Action of the hemisphere is generally crossed; but certain movements of the mouth, tongue, and neck, are bilaterally co-ordinated from each cerebral hemisphere.

4. The cerebellum is the co-ordinating centre for the muscles of the eyeball. Each separate lobule is a distinct centre for special alteration of the optic axes. The cerebellum is the organ on the

integrity of which depends the maintenance of the equilibrium of the body.

5. That Dr Hughlings Jackson's views as to the causation of epilepsies and chorea by discharging lesions of the different centres in the cerebral hemispheres is correct.[1]

Nothnagel's system of experimentation, which consists in the production of limited lesions of the gray matter by means of the injection of a concentrated solution of chromic acid, tends to support Ferrier's views; as it is found that the destruction of the ascending parietal convolution results in loss of muscular sense in the fore-leg of the opposite side of the body. Nothnagel also records other confirmatory observations.

Gudden likewise reports some most important results having a similar tendency. He has removed portions of the hemispheres from newly-born rabbits, and from observations made months after the operation, comes to the conclusion that "there is reason to locate the organic conditions of voluntary movements in the cortical substance of the brain, and that they are situated in the frontal lobe."

As opposed to the views of this school of physiologists, we have the experiments and opinions of Dupuy. That he has failed in obtaining the same results as Ferrier is no argument, as, as I have already said, those of the latter are too regular and sequential to admit of doubt; but he asserts that the same results can be obtained by irritating different parts of the gray matter, and even the stimulation of the dura mater produces cross action in the fore-legs. This observer believes that the electrical current must be propagated to the base of the brain in order to excite movement, and he has repeated the experiment of Flourens of removing the entire cerebral hemispheres without any resulting loss of muscular action; and he has further supported his theory of the propagation of stimulus, by showing that a galvanoscopic frog is thrown into a state of contraction when its nerve touches a part of the cerebral mass far from the point of excitation.[2]

This latter observation is really of no value as against the theory of Ferrier; for it is well known that during the passage of nerve force along a nerve, the natural electro-motive force of the nerve is diminished, it is affected by what physiologists term a negative variation. This negative variation is sufficient to stimulate a second nerve laid upon it, in the same way as we see in Matteucci's induced contraction. In the same manner it is evident that, if a small area on the surface of the brain be stimulated by electrodes, other portions of the brain containing nerve fibre communicating with this area will suffer a negative variation sufficient to stimulate the nerve of the galvanoscopic frog. The contractions observed by Dupuy do not show a diffusion of the electrical stimulus, but simply negative variation of other portions of the brain.

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[1] In a paper lately read before the Royal Society of London, Dr Ferrier has reported further observations, but without altering the above-recounted results.

[2] Burdon Sanderson's experiments in connexion with this subject have been published since the delivery of this lecture.—*Proceedings of the Royal Society*, 1874.

The theory of the existence of psycho-motor centres in the brain is by no means definitely settled. My own observations on the morbid histology of the brains of the insane do not appear to me to support it; for, as we shall see further on in this course, *bilateral* disease of the cortical substance can exist in the regions indicated by Ferrier as psycho-motor centres without loss or impairment of muscular power, and the cerebellum can be utterly disorganized to the extent of five-sixths of its substance without any aberration of the motility of the eyes, or loss of co-ordination of muscular action. We will postpone, however, the consideration of this question until there have been laid before you the nature and distribution of the cerebral lesions.

It is needless, Gentlemen, to recapitulate the various theories which have been advanced as to the *modus operandi* of cells and fibre in the evolution of psychical phenomena; for in this matter no leading *fact* has been experimentally demonstrated. We know nothing of the direction of electrical currents in the brain; we only know that such exist. Mr Dewar and Dr M'Kendrick lately directed your attention to the all-important fact that the influence of light could be reduced to absolute demonstration in the case of the special sense of sight, and that modifications of these influences could be measured with perfect certainty. We cannot yet see whither this system of experimentation is to lead us. If it be possible to demonstrate the mechanical operativeness of the influences which act on the organs of special sense, why may we not hope that the activity of the forces which we call psychical may yet be recorded by the galvanometer? Are emotion, volition, and actuation one whit less palpable in their immediate effect on the individual than light and sound? We all know the immediate physical effect of emotions; we blush, we pale, we grow hot or cold under their influence, the organism standing in the position of an elaborate galvanometer. When we think of the vast strides made in the science of physics within the last few years, when we regard the concentration of experimentation and ratiocination on the conduct of metals under peculiar conditions, and the vast outcome which has resulted, may we not hope that, when the physicist and the physiologist are more thoroughly merged in one common observer than they are at present, physiology will be able to assert itself as a perfect science? Without a perfect physiology we cannot have a perfect pathology. Till this is established, we can only go on working for future ages, in the hope that our labour may tend to support the observations of the coming man.

ARTICLE II.—*Royal Edinburgh Asylum Papers.* No. V. *Mania a Potu.* By H. HAYES NEWINGTON, Senior Assistant-Physician.

I HAVE purposely chosen the above title for this paper on account of its freeing one from the necessity of making more than a casual allusion to dipsomania—a subject that is not only the most difficult one to discuss of all branches of insanity, but the discussion of which is also at present a thankless task; for the more that medical men labour to prove it insanity, the more the legal mind labours to establish the crucial test of knowledge between right and wrong. A medical man is placed in the witness-box, and the whole force of judge, counsel, and perhaps jury, are set at him to bring his views piecemeal towards their own. It might conduce to a more fair approximation of opinion, if matters were reversed now and then, and the legal dogma subjected to an authoritative "heckling" by the doctors.

There are two relations between insanity and drink which admit of much argument and considerable doubt. The first is that above referred to; the cases where drinking is, at least in our views, more a symptom of alienation than a cause, where overt acts of insanity are wanting. The second is the state known as delirium tremens, which but rarely finds its way into asylums in this country, though in America the reverse obtains, and accounts to a large degree for the tremendous ratio between the number of admissions and the average number resident that is found in the reports of many institutions there. There is no doubt that this is a form of mental disease just as much as acute mania or any other variety, but we do not consider that it necessitates a man's removal to an asylum here, partly because we know that in most cases a cure, or at all events a disarming, will take place in a few days, thus making it hardly worth while to go through the annoyance of the legal forms; and partly because a certain amount of pressure can be brought to bear on these cases outside an asylum; in other words, a man is more under control of his fellow-men, in the shape of police, poor-law inspectors, hospital authorities, etc.

We come, then, to the relation between drinking and overt insanity, as seen in the cases which reach asylums without any demurring on the part of the law, and find that drink is both a cause and an effect or symptom of insanity. There is a large class of patients whose alienation can be clearly traced to intemperance. I do not here refer to the effect of a single bout, but of a lifelong bibbing, possibly between the intervals of several attacks of delirium tremens. This class has attracted considerable attention, especially on the part of Continental writers. In these cases the insanity has not at the time a very close relation to the drink; that is to say, that the mental alienation follows an accumulation of alcohol, the ingestion of which may be spread over many years. The disease seems to depend on more or less purely physical change. In some people the *materies morbi* expends itself on the liver, in others the kidneys, while again in others the structure of the brain suffers, and as a consequence loss of function is developed rather than its perversion. Therefore this class almost invariably suffer from hopeless dementia. The post-mortem appearances are fairly well known, and correspond with those found in cases that have long been subject to any form of insanity. Here there is generally but little doubt as to the causation. We know that alcohol produces certain changes in the structure of the brain, and we know also that these changes have a palpable effect on the functions of that organ; so when we see long-continued drinking pass into insanity we need not pause to inquire into other causes such as hereditary predisposition, for that is not at all necessary, though it is often present. But this is not the case in the next class, *mania a potu*, of which I give some examples below—cases where persons with brains ripened for an explosion by various causes do explode after taking a quantity of alcohol that is utterly inadequate to produce either the so-called dipsomania, or delirium tremens, or the last-referred-to variety.

It is to describe these cases that I have put my pen at all to work anywhere near such a much-discussed subject; and my reason for writing on them is that they cause a great deal of anxiety to every one connected with them—to the asylum authorities anent the question of how long they are to be kept, and the legality of keeping them at all after the mania has passed off, which it generally does rapidly—to the medical men outside, on whom falls the responsibility of diagnosing whether the person is more fit for an asylum or jail. The great point that distinguishes this class from all the others, is the small extent to which the body suffers. A patient may be most fiercely maniacal, but has little of that tremulousness that is so characteristic of delirium tremens, etc. This seems to result from the fact that, thanks to the peculiarly unstable constitution of their brains, they cannot get in a toxæmic dose of alcohol, as the least quantity so excites, that they are directly put under restraint of some kind or another. True delirium tremens, most cases of dipsomania, and all cases of alcoholic dementia, result from a continuous soaking, a great store of poison being laid up before marked symptoms are manifested. Again, though a case of this kind may clearly originate in excess, it is not at all uncommon to see a tolerably similar attack of excitement come on when it is quite impossible that the patient can have got possession of any drink. Another point is, that there is not necessarily that fearful craving that is always urging on a dipsomaniac. The view that I take of these cases is, that they always have minds that cannot concentrate themselves on the serious business; for them to work is hard; they must enjoy themselves; that they take the easiest and cheapest way of doing so; and that as drink can be got anywhere, they take a glass, and then begins the run. As will be seen below, a patient may go on for a long time without a breakdown if a sufficient stimulus to self-control can be given him. But it is not so with a dipsomaniac: give him the least chance and away he flies to drink, and at first to that only. He is that person who, later on, if he can't get whisky or good liquor, will drink methylated spirits—anything in the shape of spirits, however nasty. The other will only drink good stuff; it is his wish to give himself pleasure in some shape or another. But the dipsomaniac has this advantage, that at first his only error is drink, however low his moral tone may become afterwards; while the other is ready to sin in any particular way, whichever may first turn up. The insanity of the dipsomaniac is the *craving* for drink, which is ever present; that of the other is the *manifestation* of the effects of drink, which pass rapidly away as a rule. What is the end that a person labouring under insanity of this kind can be expected to come to? A radical cure is next to impossible: if one could eradicate the so-to-speak *passive* cause—the congenital temperament—there would be hope, for then the *active* cause—a bout of drink—would be comparatively harmless; but unfortunately, temperament cannot be thrown off, and opportunities of drinking will in all probability increase rather than decrease. The following are some of the roads that mania a potu points to:—Death by intercurrent disease, to which there must be a great liability; or perhaps by accident during an attack, or even at the hands of the law, if a jury happen to take a severe view of the homicide; or permanent residence in an asylum as a confirmed dement as above referred to; or again as a *chronic maniac a potu*, for one does sometimes see a case commencing acutely a potu, fall into that state which, I take it, Dr Skae referred to in the following words:—"And closely allied to these two forms (delirium tremens and dipsomania), we have a peculiar form of chronic insanity brought on by alcoholization, which it would be easy to delineate—one of the most constant and persistent of which are the hallucinations of the organ of hearing, which are its almost invariable accompaniment, and not unfrequently hallucinations of the sense of touch, leading to a belief in mesmeric, electric, and other unseen agencies." Dr Yellowlees has most graphically filled in this sketch, in a paper read before the British Medical Association in 1873.

I cannot do better than narrate a few cases that possess special points of interest.

CASE I.—A. C., female, was admitted for the first time into Morningside in the beginning of 1870. Since that time she has come backwards and forwards no less than six times. She has been many times also in prison for violence and theft. Very little is known of her family history, and no trace of heredity. She is a woman of the very lowest character when outside. On each occasion the attack under which she then laboured had been of very short duration, generally about two days, and had always been brought on by drink. The certificates almost invariably mentioned delusions, chiefly of an illusionary character; *e. g.*, that Dr W., who certified, had painted his face red; that she had people standing by her, etc. The general course of the attack with her is this: She drinks, gets into the hands of the police, is sent to the Asylum; she is sometimes violent for a short time, sometimes not; for two or three days she lies in bed with the symptoms of gastric catarrh, which is speedily set right; she then becomes a person of great use, helping the attendants, and taking an interest in the other patients. She is very orderly, sews, draws, makes book-markers and many other little things. She is quite honest, and says openly what she means. She never attempts to filch the tobacco or stimulants of other patients that may have them. She often expresses great regret for her past life, and for her inability to resist temptation; and this she does, not to the doctor, but to an old attendant who has great influence with her. In fact, paradoxical as it may appear, she is at heart a good woman, and, I believe, would so remain, if she did not happen to have the curse of an insane temperament on her. She has now been away for some months, and from what I can hear, is doing fairly well. During her last attack, as she was convalescing, she was allowed a pass into town for the day as a test for ascertaining her self-control. She started with many promises of keeping clear of drink, but she came back some hours late, and very drunk, and announced her arrival by smashing a good deal of window-glass in the front of the house. She then went through her usual attack, having many delusions for a short time.

In this later instance I had a good opportunity of studying the attack from nearly the commencement; for if the mania had not started within a few minutes before her arrival, she would not have been likely to have come back by herself, nor if she had tried, is it probable that she could have got the length of Morningside without falling foul of a policeman. It is also evident that the amount of liquor that she had got could not have been excessive.

CASE II.—E. M., female, has been in this Asylum twice in the last fifteen months. Her outside pursuits and manner of life are of much the same character as those of A. C.'s, being very well known to the police. She was not, however, possessed even of the slight amount of moral tone that the other had. The maniacal attacks in this instance lasted some time, and were liable to recur without the intervention of drink, while in detention. She was then very dangerous. Like the case of A. C., too, but little was known of her family history. She was a most expert thief.

CASE III.—A. B. has been a soldier, and seen a great deal of service. Was admitted a year and a half ago, from the police-office, where he had been taken for creating a disturbance. Here

too, there is but little of a previous history. Many of these cases are wanderers on the face of the earth, and easily get separated from their families, and thus the only source of information is often the police, who know perhaps as little as we do. However, from his own account, he seems to have inherited, at various times, considerable sums of money, which he has speedily run through. He has never been in an asylum before. A very short time after admission, he became very quiet and orderly, and soon showed himself to be a person of very superior attainments. He was entrusted with somewhat useful duties, and had the full liberty of the place given him, even to the possession of a pass-key. After some months' convalescence, he was sent out to town on pass, both as a test, and to make arrangements for living outside on his discharge, which was soon to take place. He returned, however, with soldier-like punctuality, but, like A. C., very maniacal—so much so, that he had to be placed in a room by himself for the night. He quickly recovered again, and after a short time regained his former privileges. He has since joined the Good Templars, and besides going every week to their meetings, has passes into town as often as he wants. He now has as much opportunity of getting drink as any one outside, but he never avails himself of them. At times he appears a little "nervous." This is a common symptom in drinking cases, and is, I think, allied to the attacks of mania that recur in E. M.'s case. The points of interest in this man's case are, first, the height to which the mania ran, when it was simply impossible, from the means and time at his disposal, that he could have imbibed any great quantity; secondly, that the stimulus of his position and good reputation are apparently now sufficient to counterbalance his moral feebleness.

Dr Yellowlees, in his clearly-written paper on intemperance, read before a meeting of the British Medical Association in 1873, states that in these cases the brain has usually been exhausted by a period of general debauchery, and is unable to keep it up, although spurred incessantly by stimulants. This was certainly not so in two of the above cases, and were it so constantly or even often, the variety would be robbed of its essential characteristic—that a great deal of mental disturbance is caused by a small amount of drink; this pre-eminently showing the want of stability in the patient's mental constitution.

Case IV. is that of a young gentleman, X. Y., only 20 years of age, who took passage, in charge of a companion, to Australia, on board a ship of which a friend, who has kindly given me these particulars, was surgeon. X. Y. was a person of good position and great wealth, and of an exceedingly agreeable nature. But he had unfortunately a proclivity to commit any species of moral evil, and this, too, quite independently of the influence of drink. As I said before, with this kind of person the first object is self-gratification and the easiest source is flown to. Whenever he got a chance he drank; but it was very little that he could take without a break-out. He would be sitting down in company, and suddenly burst out with great violence, rush out of the room, shouting, waving his hat, smashing anything that came in his way. On one occasion on shore he tried, while undressed, to get out of a second floor window, but was stopped in time. The attacks passed off as rapidly as they came, and within the next twenty-four hours he would be as fresh and healthy-looking as if he had never touched a drop. My friend came to notice, after he had seen him a few times in this condition, that immediately before an explosion there would be some twitching about the mouth, and an excited eagerness of the countenance, as if he were about to burst into the conversation with some brilliant ideas. It was his constant boast that his father died drunk in bed, and that he fully intended to follow his example.

Besides other points of interest here, the chief one is the extreme youth of X. Y. It tends greatly to show that these cases are not the result of prolonged indulgence, as is often sought to be proved when a case comes before a court of law. A person at that age, who did not show evident signs of mental insufficiency, could not possibly have come to this stage merely by his own act alone.

I quote the next case to show that drink may apparently be the direct cause of an acute attack, and indeed give a character to the symptoms, and yet be evidently a result of insanity. No doubt a vast deal of insanity is caused by drink, both directly and indirectly, but care must be exercised in charging any particular case to drunkenness. It is far too easy to say, "Here is yet another case from drink," when a person is being examined, simply because he smells of drink, or even confesses to it. The great test whereby to find out whether a case is really traceable to drink or not, is to ask what were the previous habits of the patient. Mania a potu may be said never to attack a person who has led anything like a moral life up to the time of seizure. One may, with a little care, nearly always find some preceding evidences of insanity in those cases which cannot be properly ascribed to drink.

CASE V.—C. G., æt. 28. Admitted about two years ago. Was junior partner of a respectable firm. He was sent in from the Infirmary. Was supposed there to be labouring under the influence of drink, having completely wrecked the room of a hotel where he was stopping in Edinburgh. On his arrival here, he was naturally looked upon as labouring under mania a potu; but when, a little later on, I got a full history of him, I found that such was not the case. For some time previous to his outbreak he had been behaving very curiously, but was always abstemious and hard-working. He bought things for the firm that were of no earthly use, etc. One day he went to Edinburgh, engaged a room at a hotel, and, after having a good dinner, wrecked it, as I said before. The course of the case showed that the opinion was correct that this was not true mania a potu. The acuteness of the attack passed off after a time, and he became chronically and hopelessly insane, very full of delusions, not of the objective type, *e.g.*, that spirits were annoying him, etc., but purely mythical, viz., that he was the husband of the Duchess of Inverness, etc.

We have seen thus that drink may be a cause, and also, as in the latter case, an early symptom. There can be no doubt that habits of drinking may be the *result* of insanity, which has developed itself on a causation far removed from alcohol.

Case VI.—J. K., about 55 years of age. Has held a very prominent position in society, on account of his abilities and of the culture and correctness of his manners. He has for many years past been oscillating between asylums and the outside world. Between the attacks he has the greatest abhorrence of anything like excess of liquor. He cannot bear any one to smoke near him, much less will he smoke himself. His morality is irreproachable, and his manners those of a Crichton. But when he is labouring under an attack, which generally lasts some months, there comes a sad change. He drinks anything he can get hold of, smokes cigar-ends, leaves, or anything that can be got to burn in a pipe, is loose in his conversation, is more than familiar to the opposite sex, is an expert thief, and is generally disorderly and unkempt in his dress. Eccentricity marks each of his actions. Now, supposing a man like this, instead of being a well-to-do man, and carefully watched by his relatives, were a pauper: he loses his self-control, and the attack commences, and, perhaps on account of his obscurity, continues undiscovered by the authorities for some time. He rushes into every species of immorality, but the vice that is readiest to his hand, and the one that first gives a colour to the case, is drink. Then he is sent to the asylum as a case of "alcoholism." And I have no doubt that many such cases come into public asylums with this supposed causation, simply because it is so prominent a feature that all others are overlooked.

The conclusions which I draw from what has been said in this necessarily fragmentary paper are—1*st*, That alcohol will produce a violent mania in two shapes, (*a*) *delirium tremens*, (*b*) *mania a potu.* The diagnostic points are, that in the former the body shares in the disturbance to a great degree; in the latter the bodily symptoms are trivial. The first, again, is due to saturation of the system with alcohol, in the second a small quantity *inflames.* 2*d*, That true mania a potu is almost invariably associated with other immoral tendencies, which are, however, outdone by drinking in consequence of the readiness with which it can be indulged in. 3*d*, That mania a potu may be simulated by other forms of insanity, or rather that in some cases at the outset, or even later on, a similar form of excitement may be caused by drink, but that this is not true mania a potu, and can be distinguished by an examination into the previous history, especially in the matter of general morality; and, further, that the progress of such a case will always help to reveal the true nature of the causation.

ARTICLE III.—*A Case of Strangulated Hernia successfully treated by Pneumatic Aspiration.* By J. P. BRAMWELL, M.D., L.R.C.S.E., and one of the Visiting Surgeons of the Perth Infirmary.

THE following are Dr Nairne's notes of this case up to the time I was called in consultation:—

"J. M'N., engine-driver, aged 50, had suffered for three months from inguino-scrotal hernia. He gave no heed to it, but frequently returned it without much pain or trouble. I was first called on the night of 8th October, at 11.30; found the tumour in the scrotum tender on pressure, the patient suffering intense pain, and harassed with frequent vomiting, flatulence, and general uneasiness. On inquiry I learned that the rupture had come down about 7 P.M., while he was on his engine, ten miles from here; from the great sickness, pain, and retching, and his inability to get up, he was forced to seek his way home. At 11.30 P.M. his pulse was 95, his countenance anxious, pale, and wet with clammy perspiration, and the vomited matter bilious and stercoraceous. Finding reduction impossible, I resolved to give him an opiate, apply ice, and wait till morning. 9th October, 10.30 A.M.—Patient still restless and anxious, pulse small, tongue dry and brown. Great pain affecting the whole abdomen, tumour intolerant of pressure, vomiting increasing. Resolving to operate should I again fail, I called Dr Bramwell in consultation. We tried reduction under chloroform with entirely negative results. Dr Bramwell then suggested the use of the aspirator, which he had brought with him."

With Dr Nairne's consent I now proceeded to aspirate the hernia, which was very tense, elastic, and of considerable volume. The "previous vacuum" having been formed, a No. 2 needle (Dieulafoy's) was thrust at right angles to and well into the sac; on turning the tap about two drams of serous fluid and bubbles of gaseous matter were drawn into the instrument—a sure proof that the bowel had been perforated. The aspirator was now emptied and again set, and the needle drawn somewhat outwards. This change of position evidently placed the point in the hernial sac, out of which was drawn from four to five ounces of sero-sanguineous fluid. The tumour suddenly collapsed, and on manipulation the hernial protrusion was found to have disappeared. A full dose of opium was administered, and nothing allowed till morning, except a little iced water. First morning after operation: There has been some vomiting, and the epigastrium is tender on pressure. A small blister was applied to the part pained, and half a grain each of calomel and opium given every six hours. Second morning: Vomiting gone, pain greatly diminished. To have an enema of turpentine and castor-oil. After this he had two free movements within six hours, which relieved him in every way. Feels hungry now, and is able to take light nourishment. Third day: All abdominal symptoms gone, patient convalescent, bowels have moved spontaneously. He was fitted with a good truss, and, in a few days, was able to resume his employment.

Remarks.—Judging from the archives of surgery, reduction of strangulated hernia by pneumatic aspiration is as yet quite a rare operation on this side of the Channel. In the last two volumes of the Sydenham Year-book I have searched in vain for a single recorded case; the only approach to the operation being acupuncture of an inflated hernial gut, by Mr Bryant. This, however, is not aspiration. Why an operation, the value of which has been proven in the most incontrovertible manner in France by many different surgeons, which has thoroughly established itself there, and yielded such splendid results, should be so little practised in our own country, is hard indeed to explain. This is all the more to be regretted when we consider how fatal an operation is that which is usually performed for the cure of a strangulated hernia. According to Brun-Buisson, half the cases operated on in France proved fatal. In 171 cases which I have collected from London hospital reports, the mortality was 46 per cent. Professor Spence has had admirable results—only 26 deaths in 127 cases; but even this gives 20 per cent. of fatal cases.[1] Let us contrast this with Dieulafoy's recorded cases, operated on by the aspirator where the death-rate was only 15 per cent.[2]

With such facts as these before us, it becomes a very serious question indeed, whether any surgeon is warranted as a rule in performing the old operation for hernia, before having tried the simpler and safer plan of aspiration. The one, if not sufficient, does not preclude the use of the other. It has been said, with much justice no doubt, that the chief cause of death from operations for hernia is that the procedure is too long delayed, and the bowel thus irreparably injured. No doubt this is often the case, but I have seen enough of the operation to convince me that it has inherent dangers, apart altogether from the condition of the contents of the hernial sac.

Besides all this, we do know that a hernial protrusion which has resisted all attempts at reduction by taxis at one time, may some hours after be found reducible, and hence the reluctance to use the knife, knowing its dangers; but the safety with which the aspirator can be used would encourage us to resort to early operative interference of this simple nature, while we might shrink from the responsibility of using means of a far more risky character. Even the warmest advocates of aspiration in hernia do not pretend that it is of universal applicability. Its use will not tend to the reduction of a strangulated epiplocele, but can we always be certain with what we are dealing in such circumstances? Better give the patient the benefit of the doubt, and then operate in the usual manner if there is no reduction. Neither will it suffice *per se* to reduce herniæ complicated by bands of adhesion; but its use will, by reducing the size of the gut protruded, make the ulterior cutting operation easier. In a very small hernial knuckle, such as is not unfrequently found in the femoral region, little will be achieved by aspiration. With these exceptions, there is abundant proof that the process is of wide applicability, and eminently useful for the reduction of herniæ resisting all efforts at replacement by taxis even when aided by chloroform freely administered. There can be little doubt that the general use of the aspirator would in such circumstances save many a useful life, which is sacrificed by the continued employment of a very dangerous operation for one incomparably safer and easier of performance.

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[1] See Spence's Surgery, page 1162. [2] See Dieulafoy on Aspiration, page 169.

ARTICLE IV.—*The Causes of Death among the Assured of the Scottish Widows' Fund Life Assurance Society, from* 1867 *to* 1873 *inclusive.* By J. WARBURTON BEGBIE, M.D., Medical Officer of the Society.

THE present is the fifth report on the Mortality of the Scottish Widows' Fund and Life Assurance Society submitted to its Board of Directors. The earliest of the four previous reports was presented to the Board in 1846, and the latest in 1867. These were prepared by my father, the late Dr Begbie, who, during the long period of thirty-eight years, acted as the chief Medical Adviser of the Society. To Dr Begbie is due the merit of first directing the attention of the medical profession to the valuable statistics of mortality contained in the records of Life Assurance Offices; and the example he set has not only been followed at septennial intervals by the office with which he was so long connected, but by several among the leading Assurance Companies of the United Kingdom.[1]

The total number of deaths in the septennium which closed on the 31st December 1873 has been greatly in advance of the number during any previous septennial period. This experience, however, has been according to expectation. The increasing mortality has depended on the large additions made to the membership of the Society, whereby the number of individuals exposed to the risk of death has been correspondingly augmented, and it has likewise been due to the increasing age of the Society. Owing to the latter circumstance, the causes of death which are common in the instance of persons of advanced years have become greatly more numerous. Contrast, by way of example, the number of claims included under the head of natural decay and old age, in the five different investigations. During the period which elapsed from the institution of the Society in 1815 to 1846, there occurred 6 deaths from old age; from 1846 to 1852 inclusive, 21; from 1853 to 1859, 29; from 1860 to 1866, 40; from 1867 to 1873, 74.

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[1] British and Foreign Medico-Chirurgical Review, July 1854.

It is interesting to trace the gradual increase of the total mortality during the advancing age of the Society. The number of emerged risks declared at the end of 1845, the thirtieth year of its existence, was 642; a further experience of seven years added 690 claims; another seven years, 975; yet another, 1398; and now, at the close of the last septennial investigation, we have to add 1928 deaths.

Thus the total mortality of the Scottish Widows' Fund Society, from its institution in 1815 to the end of 1873, has been 5633; and 3326 deaths have occurred during the last fourteen years.

Little need be said in the way of explanation regarding the following report. The plan pursued has been similar to that which has been followed in the previous investigations. The causes of death have been briefly considered under the different classes, the arrangement of which has been nearly the same as that in the earlier reports.

It is still a matter of regret that little care is exercised by many in making the return of the cause of death. The contrast which is offered by different certificates is immense. Some are models of accuracy, others are equally conspicuous by their defects. While imperfections of the nature now alluded to exist, it must needs be in vain to look to these records of mortality as doing more than merely indicating the nature of the diseases which prove fatal in the instance of carefully selected lives. When the experience of the Society, founded on a consideration of the mortality, appears suggestive of guidance in the selection of lives for assurance, advantage has been taken of the occasion to offer some observations. The writer ventures to hope that an increased experience may hereafter enable him, as it may also entitle him, to write with greater authority on some topics.

The causes of death, and the number of deaths in each class, are arranged and considered as follows:—

I. Epidemic and contagious disease, 142; II. Diseases of uncertain seat, 180; III. Diseases of the nervous system, 395; IV. Diseases of the respiratory organs, 403; V. Diseases of the heart and bloodvessels, 324; VI. Diseases of the digestive organs, 190; VII. Diseases of the urinary organs, 116; VIII. Diseases of the generative organs, 5; IX. Diseases of the organs of locomotion, 34; X. Diseases of the integumentary system, 10; XI. Violent deaths, 53; XII. Old age and natural decay, 74; XIII. Cause of death not ascertained, 2. Total, 1928.

I. EPIDEMIC, ENDEMIC, AND CONTAGIOUS DISEASES.

Under this class are included cholera, diarrhœa, diphtheria, dysentery, erysipelas, fever, influenza, measles, scarlatina, and smallpox.

The total mortality from these diseases has been 142.

1. *Cholera.*—From cholera there were *four* deaths, all in males; of the four, three were examples of Asiatic or epidemic cholera. One of the three occurred at Buenos Ayres, the disease proving fatal on the second day; a second at Palamacottah, Madras Presidency, in which death took place in twelve hours; the third at Liverpool in 1867, the person surviving the same number of hours. The fourth instance of cholera was one of British cholera, proving rapidly fatal. Two deaths occurred between 20 and 30; one between 50 and 60; and one between 60 and 70.

2. *Diarrhœa.*—From this cause there were *thirteen* claims, 11 in males, and 2 in females. Of the 13, 8 had attained a greater age than threescore years and ten; and only one of the 13 was below 50 years of age.

3. *Diphtheria* was the cause of death in *six*, all males. One of the six had attained the age of 66 years; another of 58; two were 39 years old; and the remaining two 29 and 27 respectively. In one the illness lasted only 48 hours; in a second, 2 days; in two, 5 days. Of the remaining cases, paralysis led to the fatal result in one, after a month's illness (æt. 29), while the 6th (æt. 27) had pericarditis as a complication, death occurring on the third day. The insured had suffered from an attack of diphtheritic sore throat before his acceptance. The mean age of these members at death was 43, which is certainly a more advanced age than that of the usual sufferers from diphtheria.

From the institution of the Society in 1815 to the year 1866 inclusive, there had only been one claim on account of diphtheria. The recent experience of the Scottish Widows' Fund illustrates two important facts: *first*, that the disease is more prevalent than formerly; and, *second*, that fatal diphtheria in the adult cannot be regarded as uncommon.

4. *Dysentery.*—This disease accounts for *seven* deaths, 5 in males and 2 in females.

Two of the sufferers were above 80 years; one was 65; two between 50 and 60; one 45, and one 32. One death occurred during an epidemic prevalence of the disease at Limerick in 1870. One took place at Sydney, and one at Ontario. In one instance the dysentery was of chronic character and contracted in China; in another, disease of the liver had supervened on the affection of the bowels.

5. *Erysipelas.*—*Fifteen* claims there were on account of this disease, all in males. Of these, 2 occurred between 30 and 40; 1 between 40 and 50; 4 between 50 and 60; 6 between 60 and 70; and 2 between 70 and 80.

One of the fifteen was insured at the age of 40, with ten years added to his age on account of a damaged heart from previous rheumatic fever; he died at 53, thirteen years after his acceptance, and seventeen short of his expectation.

One case resulted from wound occasioned by a fall, and in another the erysipelas supervened on an abscess.

6. *Fever.*—Under the head of fever there rank *sixty-nine* deaths, of which number 67 occurred in males, and 2 in females.

A scrutiny of those sixty-nine claims has resulted in the following divisions:—

a. Typhus fever, 21; *b.* Typhoid fever, 31; *c.* Senile fever, 7; *d.* Gastric fever, 1; *e.* Bilious fever, 1; *f.* Continued fever, 1; *g.* Remittent fever, 2; *h.* Yellow fever, 4; *i.* Jungle fever, 1.

Of the two deaths among females, one was from typhoid fever at New York in 1868, the other from gastric fever at Tain in Ross-shire.

a. Typhus.—Eleven deaths from typhus fever occurred in *Scotland*—4 of these in Edinburgh, 4 in Dundee, 2 in Glasgow, and 1 in Lanark.

Five deaths from the same fever occurred in *England*—2 in York, 1 each in Newcastle-on-Tyne, and in rural districts of Lancashire and Warwickshire; and five deaths likewise occurred in *Ireland*—1 in each of the following places, Dublin, Londonderry, Lurgan in Armagh, Limerick, and Cavan.

The occupations of the persons who died of typhus were very various; 3 were butchers, 2 medical men, 2 writers, 2 farmers, 1 city missionary, 1 clergyman, 1 grocer, 1 fishcurer, 1 printer, 1 tobacconist, 1 clothier, 1 boot and shoe merchant, 1 clerk in newspaper office, 1 stockbroker, 1 merchant, 1 draper.

Of the 21 deaths from typhus, 1 occurred between 20 and 30; 5 between 30 and 40; 5 between 40 and 50; 5 between 50 and 60; 3 between 60 and 70; and 2 between 70 and 80.

In the emerged risks from typhus, death is stated to have taken place on the 3d day of the disease in 1; on the 4th day in 1; on the 8th day in 6; the 9th in 2; the 12th in 2; the 13th in 1; the 14th in 5; the 18th in 1 in the 3d week in 1; and in the 5th week in 1 from nervous exhaustion.

b. Typhoid or Enteric Fever.—Of the *thirty-one* deaths from this form of fever, 10 occurred in *Scotland*—2 in Edinburgh, 1 in Musselburgh, 1 in Glasgow, 1 in Melrose, 1 in Kirkcudbrightshire, 1 in Bute, 1 in Chirnside, Berwickshire, and 2 in Kirkcaldy; 8 took place in *England*—1 in London, 1 in Manchester, 1 in Huddersfield, 1 in York, 1 in Nottingham, 1 in Chiswick, 1 in Wimbledon, and 1 in Lancashire; 3 occurred in *Ireland*—1 in Dublin, 1 in Tipperary, and 1 in Kilkenny.

Ten occurred in foreign parts—2 in New York, 1 in New Zealand, 1 in South Australia, 1 in Cairo, Egypt, 1 in Teheran, Persia, 1 in Florence, 1 in Malta, 1 in St Petersburg, and 1 in Dresden.

There is material for contrast between the occupations of those who died from typhoid and from typhus fever. Of the former, 5 were independent gentlemen, 4 were clerks in offices, 3 were solicitors, 3 clergymen (one of these died at Florence), 2 farmers, 2 drapers, 1 commercial traveller, 1 watchmaker, 1 manufacturer, 1 baker and corn-dealer, 1 regimental band-master, 1 banker, 1 merchant, 1 engineer, 1 leather-dresser, 2 book-keepers, 1 female.

Of the 31 deaths from typhoid fever, 4 took place between 20 and 30; 12 between 30 and 40; 3 between 40 and 50; 3 between 50 and 60; 4 between 60 and 70; 3 between 70 and 80; and 2 above 80.

In one case, hæmorrhage from the bowels was the immediate cause of death. This took place in the third week of the disease; in a second instance, perforation of the bowels with peritonitis occurred on the 17th day of the fever; in two chest complications led to the fatal result. One was ill for ten weeks, another for six, a third for three weeks, a fourth for four, a fifth for five, a sixth for "some weeks." One succumbed after an illness of three months, attended by bed-sores, and another after the disease had lasted a still longer time.

c. Febris Senilis.—From the "fever of old age" there resulted *seven* deaths, all in males—2 occurred between 60 and 70; 1 between 70 and 80; 3 between 80 and 90; and 1 above 90; in the last case there were bed-sores. In all of these the expectation of life was exceeded, and in two of the seven, by fully twenty years.

d. e. f. Gastric, Bilious, Continued Fever.—Under each of these heads one death has been recorded.

g. Remittent Fever.—Of *two* deaths from this cause, 1 took place at Callao, Peru, the other at Calcutta; the age of the former was 24, of the latter 35. Both were recently insured, and both were for the first time visitors to foreign climates.

h. Yellow Fever.—*Four* deaths occurred from this much-dreaded malady. One at Jamaica, within two years of the individual's acceptance, one at Rio de Janeiro, within a similar period, but seven years had been added to his age owing to death of a brother from consumption at 22; one at Pernambuco in the third year after acceptance; the fourth at Callao, Peru, that member having been assured a little over one year.

i. Jungle Fever.—One death from jungle fever took place at Colombo, Ceylon, in the person of an Indian civil servant, æt. 25, who had been insured a little over four years.

7. *Influenza* accounts for *five* claims, all in males; four of these were above 70 years of age; two of the four above 80. The fifth insurer died at 27, before the expiry of the first year of his assurance.

8. *Measles.—One* male, æt. 27, died of measles. The fatal event occurred on the ninth day of the disease, and was probably due to an intestinal complication.

9. *Scarlatina.—Four* deaths were due to scarlet fever, and all of these took place between 30 and 40 years of age. In one of the four sufferers, five years had been added to age at acceptance on account of a previous attack of gout. One of the four was a medical man, and it may be presumed that the disease was in his case contracted during his professional avocations.

10. *Smallpox.—Eighteen* deaths, of which 17 were in males and 1 a female, resulted from smallpox.

Of these, 3 occurred between 20 and 30; 7 between 30 and 40; 2 between 40 and 50; 4 between 50 and 60; 1 between 60 and 70; and 1 between 70 and 80.

One of the 18 had, on acceptance, had five years added to age, on account of delicacy in appearance. In three the disease is described as confluent. In one case the disease proved fatal on the 4th day; in 3 cases on the 5th day; in 1 on the 6th day; in 1 on the 7th day; in 1 on the 8th day; in 2 on the 9th day; in 4 on the 10th day; in 1 on the 11th day; in 1 on the 13th day; in 1 on the 16th day; in 1 on the 17th day; in 1 from subsequent pneumonia in the 4th week—in this case, moreover, an addition of five years to age, on acceptance, had been made on account of mother's death from phthisis.

Of the eighteen deaths from smallpox, 9, or one-half, occurred during 1871; 6 during 1872; and 3 during 1873.

Five deaths took place in London, all in 1871; 1 in Manchester; 1 in Norwich; 1 in Wiltshire; 2 in Edinburgh; 1 in Leith; 2 in Forfar; 1 in Falkirk; 1 in Dalkeith; 1 in Glasgow; 1 in St Petersburg; and 1 in Oporto.

The number of deaths from smallpox during the past septennium, is exactly double that of the deaths from this cause from the institution of the Society in 1815 to 1866, at which time the present investigation commences. This increased mortality from smallpox is due to the circumstance of an epidemic prevalence of the disease in different parts of the country, as well as abroad, during the years 1871, 1872, and 1873.

There can be little doubt that a more rigid performance of re-vaccination than is often carried out would have prevented some at least of these deaths.

II. Diseases of Uncertain Seat.

Under this class are included, abscess, Addison's disease, atrophy, cancer, debility, diabetes, dropsy, gout, hæmorrhage, inflammation, leukæmia, mortification, pyæmia, sudden deaths, ulcer.

The total mortality from these diseases has been 179.

1. *Abscess* accounts for *eight* claims, seven males and one female; the particulars of these are as follows:—

Male æt. 24.—Abscess of back and breast.

Male æt. 41.—Abscess consequent on rheumatic fever.

Male æt. 42.—Tubercular mesenteric and hepatic abscess.

Male æt. 52.—Psoas abscess, 18 months ill.

Female æt. 57.—Lumbar abscess from vertebral disease, after an illness of 18 months. Three adult brothers and a sister had died before her acceptance at 52.

Male æt. 60.—Abscess in loin, following empyema, 5 months ill.

Male æt. 63.—Abdominal abscess, died from exhaustion.

Male æt. 67.—Abscess supervening on carbuncle, three and a half months ill.

2. *Addison's disease.*—Male æt. 43, was insured at 38; his expectation of life was then 38 years, and he survived 5. There was no *post-mortem* examination.

3. *Atrophy.*—The information regarding the four claims on account of this cause, 3 males and 1 female, is very meagre; 1 died at 59; 1 at 68; and 2 at 69.

4. *Cancer.*—Under this head there ranks the large number of *eighty-eight* claims, of which 73 are males, and 15 females—a complete reversing of the degree of liability of the sexes to cancer, but to be explained, like many other facts of a similar nature in the mortality of the assured, by the limited number of policies held by females.

It is to be regretted that in only 9 out of the 88 instances of cancer, was a *post-mortem* examination made.

Of these eighty-eight claims, 1 occurred between 20 and 30; 3 between 30 and 40; 17 between 40 and 50; 25 between 50 and 60; 30 between 60 and 70; and 12 between 70 and 80.

Of the 15 females whose deaths resulted from cancer, 3 occurred between 40 and 50; 3 between 50 and 60; 8 between 60 and 70; and 1 between 70 and 80.

In 6 of these 15, the uterus was the seat of cancer; in 1 the breast; 1 the liver and pancreas; 1 the liver alone; 1 the ovary; 1 the rectum; 1 the pylorus of stomach, and ovary; while in the remaining three the particular seat of the disease is not signalized.

Of the 73 deaths from cancer in males, the seat of the disease is stated to have been as follows:—In the stomach in 12; in stomach and duodenum, 1; in duodenum, 1; at pylorus, 4; in colon, 1; in descending colon, 1; in sigmoid flexure of colon, 1; in caput cæcum coli, 1; in rectum, 4; in mesentery, 1; in omentum, 1; in liver, 3; in bowel or bowels, 3; in œsophagus, 3; in throat or neck, 1; in throat, 1; in neck, 1; in lip, 1; in tongue, 3; in parotid and cervical glands, 1; in mouth, 1; in neck and mouth, 1; in orbit, 1; in bladder, 2; in bladder and prostate, 1; in urinary organs, 1; in abdomen, 3; in pelvic lymphatics and pleura, 1; in lung, 1; in ilium, 1; in groin, open cancer, 1; cancer without specification of seat, 14.

In looking over the various returns connected with these eighty-eight claims from cancer, the following appear worthy of special notice:—

(1.) Male æt. 66.—"Open cancer of groin," of ten months' duration. Foot had been amputated on account of ulcer of sole, five years before acceptance. Father had died at 50, cause unknown. Endurance of policy was 1 year and 73 days. The life was accepted on the recommendation of one of the ablest and most distinguished physicians in the United Kingdom.

(2.) Male æt. 58.—"Scirrhus of stomach." Mother had died æt. 66, of "fungus hæmatodes."

(3.) Male æt. 65.—"Cancer of omentum," accepted as a hernia risk, with usual addition to premium. There was a *post-mortem* examination in this case.

(4.) Male æt. 63.—"Cancer of ilium," a hernia risk, accepted with addition to premium on that account.

(5.) Male æt. 52.—"Cancerous tumour involving the orbit." Mother had died of uterine disease. Maternal uncle of cancer of face. Paternal aunt of cancer of face. There was a *post-mortem* examination in this case.

(6.) Male æt. 55.—"Cancer of stomach." Brother had died of liver complaint before his acceptance.

(7.) Male æt. 46.—"Cancer of rectum;" two years and six months ill; had fistula in ano the year before acceptance. Expectation of life 26 years; lived only four.

(8.) Male æt. 55.—"Cancer of pelvic lymphatics, and pleura." There was a *post-mortem* examination in this case.

(9.) Male æt. 45.—"Cancer of lung." There was a *post-mortem* examination in this case.

(10.) Male æt. 29.—"Cancer of duodenum, with fatal hæmorrhage." Expectation of life on acceptance 36 years, actual endurance 2 years. There was a *post-mortem* examination in this case.

(11.) Male æt. 51.—"Epithelial cancer of lip," subsequent suppuration of glands in the neck.

5. *Debility* is assigned as the cause of death in *twenty-two* instances, of which 19 were males and 3 females; 1 death occurred between 30 and 40; 3 between 40 and 50; 4 between 50 and 60; 3 between 60 and 70; 8 between 70 and 80; and 3 between 80 and 90.

6. *Diabetes* proved fatal in *twenty-two* instances, of which 21 were males and 1 female. Of these twenty-two deaths, 2 occurred between 20 and 30; 1 between 30 and 40; 3 between 40 and 50; 5 between 50 and 60; 8 (including the one female claim from this cause) between 60 and 70; 2 between 70 and 80; and 1 between 80 and 90.

One of the twenty-two was accepted with an extra premium for gout, from which he had previously suffered in a mild form. In one the fatal disease was complicated with paralysis; in one with pleurisy; in one with apoplexy; in one with effusion on the brain. One of the sufferers from diabetes died suddenly. In one instance the disease was consequent upon extreme mental depression, and in this case it is recorded that anthrax and boils appeared on different parts of the body.

7. *Dropsy* still appears in the mortality list as a cause of death, but happily the numbers it includes are few—*seven* in all—6 males and 1 female; 1 insurer died between 40 and 50; 3 between 50 and 60; 1 between 60 and 70; and 2 between 70 and 80.

Dropsy is given as the cause of death in 4. Ascites in 1. Dropsy, and œdema of lungs in 1. Dropsy, general, with bronchitis in 1.

8. *Gout* is assigned as the cause of death in *seven*, these all males. In 3 the fatal event occurred between 50 and 60; in 3 between 60 and 70; and in 1 between 70 and 80.

In only one of these seven had an extra charge been made on account of a previous attack of gout, and that only on the individual effecting a further insurance.

A glance at these seven claims may not be uninteresting:—

(1.) Æt. 65.—Rheumatic gout—fell short of expectation by four years. Fatal disease complicated with bronchitis.

(2.) Æt. 79.—Had suffered from indigestion before acceptance—survived his expectation by four years.

(3.) Æt. 64.—In this case a gout extra had been charged on a recent insurance. The fatal disease was complicated for four days before death with purpura.

(4.) Æt. 55.—Gout with obstruction of the bowels. Had rheumatic attack before acceptance.

(5.) Æt. 57.—Rheumatic gout.
(6.) Æt. 65.—Gout complicated with pneumonia.
(7.) Æt. 55.—Retrocedent gout.

9. *Hæmorrhage* was fatal in *four* males—

1 æt. 31—source of hæmorrhage not stated; 1 æt. 37—hæmoptysis; 1 æt. 40—hæmorrhage from stomach; and 1 æt. 62—pulmonary hæmorrhage—sudden death.

10. *Inflammation.*—*One* case only of inflammation in a male, æt. 72, appears, the internal ear being the seat of the disease.

11. *Leukæmia.*—*One* male. Accepted at 44, died at 56. Expectation of life 25, survived 12 years.

12. *Mortification* appears as a fatal cause in *six* instances, all males; in one between 50 and 60; 3 between 70 and 80; and in 2 between 80 and 90.

In three of these cases the disease is characterized as senile gangrene, depending upon degeneration of the arterial system, and in these three the subjects were all above 70, two being octogenarians. In two others the mortification is described as of the leg, and in one of the foot.

13. *Pyæmia.*—*Five* deaths resulted from this cause in males; 2 were between 40 and 50; 1 between 50 and 60; 1 between 60 and 70; and 1 between 70 and 80.

The disease was consequent upon phlebitis and prostatic enlargement in one instance; on gangrene of foot in a second; upon perineal abscess in a third; upon disease of the tarsal bones in a fourth; and on mediastinal abscess in the fifth.

14. *Sudden death* is given in *three* instances, all males, as the entry for the mortality register, without any definite explanation, although it may reasonably be concluded that in each of the three, disease of the heart determined the fatal event.

1st, æt. 56, was in reduced circumstances; 2d, æt. 49, had been suffering from dyspepsia and mental disturbance. He had not been insured one year. 3d, æt. 75, died while at stool, and when suffering from biliary derangement.

15. *Ulcer.*—*One* male died, æt. 67, from ulcer of the foot.

III. DISEASES OF THE BRAIN AND NERVES.

The total mortality from diseases affecting the brain and nervous system has been 395.

Under this class are included apoplexy, cephalitis, chronic alcoholism, delirium tremens, disease of brain, epilepsy, hemiplegia, insanity, locomotor ataxy, meningitis, nervous exhaustion, paralysis, paraplegia, sunstroke.

1. *Apoplexy.*—From this fatal disease there are *one hundred and twenty* claims, 116 being males and 4 females.

Of the 120 deaths, 1 occurred between 20 and 30; 10 between 30 and 40; 17 between 40 and 50; 29 between 50 and 60; 39 between 60 and 70; 16 between 70 and 80; 7 between 80 and 90; and 1 between 90 and 100.

No fewer than sixty different occupations or positions in life are included under the 120 sufferers from apoplexy. Two were noblemen; 13 merchants; 6 clergymen; 5 bankers; 3 medical men.

Curiously enough, two of those who reached the greatest age were distillers. One of the two died at 92, having insured at 49—his expectation of life being then 21 years; the endurance of his policy was 43 years. The other died at 84; he had assured originally at 40, and subsequently re-insured at 53. Under the former policy his expectation of life was 27 years; its actual endurance, 44; under the latter, expectation was 18 years, and endurance 31.

The occurrence of fatal apoplexy under 40 years of age is to be regarded as exceptional; those changes of a degenerative character in the bloodvessels, which are intimately connected with the cerebral extravasion, rarely taking place till a somewhat advanced period of life has been attained. The influence of irregular habits, of syphilis, gout, and rheumatism, in inducing, at an earlier age, degeneration in the vascular system, including the cerebral, must not be overlooked.

Of the 11 deaths from apoplexy, in the experience of the Society, which occurred under 40 years of age, 3 took place in hot climates; 1 in Ceylon, the gentleman, æt. 34, being found dead; the 2d, æt. 38, died from heat apoplexy at Hydrabad, East Indies; and the 3d, æt. 37, at Allahabad. A fourth death resulted from exposure to great heat at Madras; but the sufferer in this instance had reached the age of 66. The youngest victim of apoplexy had only reached the age of 22; his father had died of the same disease at 66.

In 31 of the 120, the expectation of life fell considerably short of the actual endurance. The longest endurance was in the instance of the distiller already referred to, in which the expectation of life was exceeded by 22 years. Endurance extended to 20 years beyond expectation in the case of a venerable and highly esteemed peer, long a prominent office-bearer of the Society. The shortest endurance was in the instance of a locomotive superintendent, who died at Allahabad in India, within a twelvemonth after acceptance. His is a class of risks not likely to prove profitable to assurance offices.

Of these 120 deaths from apoplexy, the largest number in any one month took place in January, namely 16; and the smallest in

December, 5. In September and November each, 12 occurred; in July and August each, 11; in Februury, March, and May each, 10; in April, 9; in June and October each, 7.

The duration of the fatal illness varied from a few minutes to several days. In 62, or more than one-half, death occurred within twenty-four hours of the seizure. One death is stated to have resulted from the immoderate use of alcoholic liquors on board of a ship, of which the victim was captain.

One had suffered from periostitis before acceptance, raising the suspicion of syphilis. *Post-mortem* examination in one instance revealed the existence of hypertrophy of the heart, consequent upon rheumatism. In another, examination of the body after death determined the existence of fatty heart; blood had in this case been extravasated into the lateral ventricles of the brain.

In one instance the fatal apoplexy occurred during the progress of a case of diabetes. The intimate connexion of disease of the heart, and still more of the bloodvessels, with apoplexy, and of the former of these with rheumatism, is amply illustrated in those claims on account of death from cerebral hæmorrhage.

2. *Cephalitis.*—*Five* males are reported to have died from cephalitis; 1 at 24; 1 at 25; 1 at 51; 1 at 70; and 1 at 78. The youngest of these died at Alexandria in Egypt. Of the second youngest it is recorded that a brother and sister died at 30 and 19 years of age respectively, probably of consumption.

3. *Chronic Alcoholism.*—From this form of disease of the nervous system, the direct consequence of the abuse of intoxicating drinks, there died *three* males, of the ages of 35, 42, 51. In one of these pneumonia existed as a complication.

4. *Delirium Tremens* led to the death of *nine* males. One death occurred between 20 and 30; 3 between 30 and 40; 1 between 40 and 50; 2 between 50 and 60; 1 between 60 and 70; and 1 above 70.

The occupations of these victims were as follows:—One militia officer; one hotel-keeper; one victualler; one farmer and contractor; one medical man; one newspaper editor; one sheriff-clerk; one writer; and one grocer.

In three of the nine an extra premium had been exacted at the time of acceptance. In the instance of the victualler, on account of occupation, he was then stated to take drink moderately; in the militia officer, on account of a previous rheumatic attack; in the case of the farmer and contractor, because, although his habits were stated to be regular, he was overwhelmed with business.

It is matter for congratulation that the number of claims on the Society on account of delirium tremens and chronic alcoholism, two diseases which are the direct results of intemperance, are so limited, being twelve in all. Notwithstanding the great and increasing care which is exercised by the Directors in reference to the habits of proposers, it can scarcely be expected that these two diseases can be altogether removed from our lists of mortality. The youthful age at which many insure—an age earlier in not a few instances than the formation of habits—will undoubtedly prevent such a consummation, although devoutly to be wished for.

The wise and wholly just rule of the Directors, to decline under all circumstances the proposals of spirit-dealers, of travellers in the spirit trade, and to exercise a very careful scrutiny in respect to the habits and character of hotel-keepers, commercial travellers, and others who are of necessity exposed to peculiar temptations in the matter of drink, have done much and will do more to protect the interests of the assured from such claims as intemperance is apt directly to produce.[1]

5. *Disease of Brain.*—Under this head are included *one hundred and eighteen* claims, of which 109 were males and nine females.

Of the 118 deaths, 2 occurred between 20 and 30; 14 between 30 and 40; 15 between 40 and 50; 21 between 50 and 60; 28 between 60 and 70; 31 between 70 and 80; and 7 between 80 and 90.

Of the 118 cases of disease of the brain, many are described simply as disease of brain, others as softening, others as congestion of the brain, others as convulsions, one as tumour. In this case there was a post-mortem examination. The insurer, a gentleman, had long suffered from stomach disorder. Accepted at 45, his policy lapsed at 51.

The following particulars taken from some of those cases are of sufficient interest to quote:—

1st, Male, died of congestion of brain at 27, 4 years after acceptance. His father had died of epilepsy at 56.

2d, Male, died of congestion of brain at 29, 3 years after acceptance; his mother had died of consumption shortly after his birth; on that account five years had been added to his age on acceptance.

3d, Male, died of convulsions, æt. 43, 3 years after acceptance. He had rheumatic fever when a youth, and occasional irregularity of the heart's action had been noticed before acceptance.

4th, Male, died at 37, having been accepted at 27. In this case disease of the brain first showed itself in the form of epilepsy, and to epilepsy succeeded insanity.

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[1] PUBLICANS.—Looking to the facts shown in the Registrar-General's Returns, that innkeepers or publicans are subject to a higher rate of mortality than any other class in the community, the directors have resolved to decline assuring the lives of persons engaged in that occupation, as well as travellers, salesmen, and others connected, in their daily avocations, with the retail spirit trade. Keepers of hotels, properly so called, are not necessarily ineligible, but the directors are very particular in requiring full and satisfactory evidence as to their habits.—*Instructions to Agents*, p. 15.

In the instances of *softening of the brain*, the duration of the illness is stated to have been in one 5 years, in four 4 years, in one 3 years, in three 2 years, in one 18 months, in two 1 year, in one 10 months, in one 9 months, in one 8 months, in one 4 months, in one 3 months; while in several the disease is stated to have been chronic.

The occupation or position in life of the sufferers from softening of the brain was as follows:—1 female, 1 farmer, 1 farmer and brewer, 1 secretary of benevolent society, 2 clergymen, 1 clerk, 1 engineer, 1 wool merchant, 1 merchant, 1 commission merchant, 1 banker, 1 cashier, 1 solicitor, 1 tea-dealer, 1 cotton-spinner, 1 bookseller and stationer, 1 brassfounder, 1 potter, 1 gentleman.

Syphilis had existed in one case of cerebral softening in which the duration of the policy was little more than one year. The injurious influence of constitutional syphilis on the vascular system, the blood, and the great nervous centres, likewise in the production of liver and kidney disease, is now better known and understood. A proposer who has suffered from constitutional syphilis in a severe and still more in a protracted form, ought not under any circumstances to be considered as a first-class life for assurance.

In the cases of softening of the brain, death occurred in 1 between 30 and 40; in 2 between 40 and 50; in 5 between 50 and 60; in 9 between 60 and 70; and in 6 between 70 and 80.

6. *Epilepsy* was the cause of death in *twelve* male members.

In 2 death took place between 20 and 30, in 1 between 30 and 40, in 4 between 40 and 50, in 2 between 50 and 60, in 2 between 60 and 70, and in 1 at 80.

In three of these the occupation is worthy of notice. 1st, a wine merchant, was one month ill; he had become intemperate some little time after his insurance was effected. His father had died from the effects of drinking. His policy existed for little more than one year.

The hereditary character of the tendency to excess in the use of stimulants is painfully illustrated in this instance, and quite as notably so in many other cases in the Society's experience. 2d, An innkeeper, was insured 8 years, his expectation of life at the time of acceptance being 21 years. 3d, An hotel-keeper, was insured only three years.

In one of the 12 victims of epilepsy, death succeeded a fall during a fit. In one who exactly reached his expectation period, 34 years, the fatal malady showed itself for the first time 2 years before death.

7. *Hemiplegia.*—*Nine* deaths are returned under this head, 8 in males and 1 a female.

The ages at death were 47, 58, 69, 70, 72, 73, 74, 77, and 81.

In one of the nine it is noted that the hemiplegia of the right side existed with aphasia. In one the hemiplegia is described as having been on the left side.

8. *Insanity.—Insanity* is stated to have been the cause of death in *four* males, of the ages of 38, 46, 55, and 56. Two of the four were farmers, one a bank teller, and one a merchant. In the family history of none of the four was there any evidence of unsoundness of mind.

One of the four was a case of acute mania, proving fatal on the 10th day. Two of the four died in asylums. One of the two was choked when attempting to swallow a large piece of bread.

All four fell far short of their expectation of life.

9. *Locomotor Ataxy.—Three* deaths resulted from this form of disease of the nervous system, which for the first time finds a place in the nosological arrangement adopted by the Society.

1st, bank agent, died æt. 75, having been accepted at 40. The certificate of death in this case bears that the progressive locomotor ataxy was complicated with heart disease and dropsy. 2d, physician, died at 60, having been insured at 43; the disease had existed for five years. 3d, wine and spirit merchant, died at 45, was insured at 41. Duration of illness stated to have been four years. This man had become intemperate in habits.

10. *Meningitis.—Five* male insurers are stated to have died from inflammation of the membranes of the brain.

The ages of the five were, 33, two 55, 66, and 76.

In one the fatal disease supervened on mania, in a second on otitis. One was a case of chronic meningitis, in which the duration of the disease was fully twelve months. In one case the disease ran a very acute course, and was accompanied by paralysis. The victim scarcely survived acceptance one year. His mother had died of apoplexy at 47.

11. *Nervous Exhaustion.*—Under this head *two* deaths, both in males, are recorded, at the ages of 68 and 71. In the latter, the great heat of the weather (18th August 1866) is assigned as the cause.

12. *Paralysis.—One hundred and two* deaths are returned under the name of paralysis—one hundred being males, and two females. Of these 102 deaths, 5 took place between 30 and 40; 6 between 40 and 50; 22 between 50 and 60; 28 between 60 and 70; 36 between 70 and 80; and 5 between 80 and 90.

Three were cases of paralysis agitans. These proved fatal at 70, 71, and 73 years respectively, and the disease had existed for 3 years in 1, for 8 years in 1, and during "several years" in the third.

General paralysis existed in 5; general paralysis of the insane in 4. In 1 of these four it was known that the victim, a commercial traveller, had become intemperate; he survived his acceptance

15 years, but his expectation of life at that time was 40 years. The other three died in asylums; one surviving acceptance 11 years, while his expectation was 25; another dying within the first year of his insurance, his expectation being 33 years. In this case, family and personal history, as given in the papers, were quite clear; in particular, the habits in both were exemplary. In the remaining case, that of a traveller, the habits were stated to be sober; he died within two years of his acceptance.

In one of the instances of general paralysis, the disease had continued 20 years; he was accepted at 47, and died at 68; his expectation was 23 years, and he completed 22. Before acceptance, he had suffered from rheumatic pains in the limbs, and had also been subject to a spasmodic affection in them. Paralysis in one case occurred in the course of diabetes, in another the disease was consequent upon spinal curvature. In one instance the paralysis was complicated with heart disease, in another with myelitis, in one connected with gangrene of the nates and feet; and in two with long-continued disease of the bladder.

As in the instance of apoplexy, the members of the learned professions, the church, law, and medicine, are fully represented in those dying from paralysis. Merchants, bankers, agents, commercial travellers, and military men, rank next in order, and many of the industrial occupations are represented, but in less number than holds true of the former class.

13. *Paraplegia.—One* death in a male insurer of 55 is thus recorded. Bed-sores and hæmorrhage had occurred towards the close of life.

14. *Sunstroke.—Two,* 1 male and one female, died from this cause. The former, an accountant, æt. 27, whose endurance of life after acceptance was only 7 years and 110 days. He died in August 1873. The latter died in July 1872, after an illness of 5 days, in Merionethshire, Wales, æt. 71, having nearly fulfilled her expectation of life.

IV. Diseases of the Respiratory Organs.

The total mortality from diseases affecting the respiratory organs has been 403.

Under this class are included the following diseases:—Asthma, bronchitis, consumption, disease of the lungs, hæmoptysis, hydrothorax, laryngitis, pleurisy, pneumonia, quinsy.

1. *Asthma.*—There are *eight* claims on account of asthma, 7 in males and one female; of these, 3 died between 50 and 60; 2 between 60 and 70; and 3 above 70. Two of these cases are described as proving quickly fatal, and were in all probability instances of cardiac disease.

2. *Bronchitis* accounts for no fewer than *one hundred and twenty-five* deaths, 115 in males and 10 in females. Of these 125 deaths, 2 occurred between 20 and 30; 2 between 30 and 40; 15 between 40 and 50; 29 between 50 and 60; 30 between 60 and 70; 33 between 70 and 80; and 14 between 80 and 90. Or 48 of the 125 deaths happened under 60 years of age, and 77 above that period. The contrast afforded between the fatal ages of bronchitis and consumption is striking. Bronchitis is especially a fatal disease in the elderly, and the experience of the Society confirms this.

In 3 only of the 125 claims on account of bronchitis, was an extra premium required at the date of entry. In 1st, who insured at 39 and died at 58, whose expectation of life was 28 years and his realization 19, on account of rheumatic attacks before acceptance, 5 years were added to age. In 2d, insured at 45, and died at 62, expectation of life being 24 years, and realization 18, 3 years were added on acceptance, on account of liability to colds. In 3d, insured at 37, with addition of 5 years to age, on account of heart's action being feeble and liability to bronchitis. This insurer only survived seven years. His proposal ought to have been declined.

In 72 of these 125 risks the duration of life fell short of the expectation; in 48 the duration exceeded the expectation; and in 5, duration exactly equalled expectation. It will be seen, however, from a glance at the ages of the emerged risks, that many others very nearly reached their expectation period.

Take three of the most remarkable endurances under this head: 1st, male, insured at 56; expectation 16 years, died at 88, having exactly doubled his expectation in living 32 years. 2d, male, insured at 39; expectation 28, died at 83, having lived 43 years from the time of acceptance, or 15 years in excess of expectation. 3d, male, insured at 50; expectation 21 years, died at 84, having lived 35 years from the time of acceptance, or 14 years in excess of expectation.

3. *Consumption* includes *one hundred and forty-five* emerged risks; 137 being those of males, and 8 of female insurers. Of these 145 deaths, 25 occurred between 20 and 30; 46 between 30 and 40; 42 between 40 and 50; 21 between 50 and 60; 8 between 60 and 70; and 3 above 70 years of age.

The Society's experience may be very strikingly put as follows: Of 145 deaths from consumption, as many occurred above as under 40 years of age. Of the 3 instances fatal above 70 years, it so happens that two were seen by me, and both of these were unequivocal examples of chronic pulmonary consumption. The first of these three, with a clear personal and family history, insured at the age of 41; his expectation of life was then 25 years, and he survived 28. The second, with similar personal and hereditary qualifications, insured at 37; his expectation of life being then 29 years, he survived 35. The third insured at a later period of life than these two, his first premium being paid at the age of 56, and his last at 72; he had exactly fulfilled his expectation period.

Take the instances, eight in number, fatal above 60 and under 71 years of age. 1st, Insured at 42, died at 63; his expectation 26, his realization 22 years. 2d, Insured at 46, died at 68; his expectation 23, his realization 22 years. 3d, Insured at 30, died at 65; his expectation 34, his realization 35 years. 4th, Insured at 42, died at 61; his expectation 26, his realization 20 years. (A sister of this member had died, before his acceptance, of consumption at 23 years of age.) 5th, Insured at 29, died at 61; his expectation 34, his realization 33 years. 6th, Insured at 50, died at 65; his expectation 21, his realization 16 years. (The father of the insured had died at 40 from intemperance, and his mother at the same age, after having borne a large family.) 7th, Insured at 30, died at 67; his expectation 34, his realization 37 years. 8th, Insured at 38, died at 62; his expectation 28, his realization 24 years.

It is worthy of remark, that of the eleven members of the Society whose deaths occurred from consumption above 60 years of age, only three had entered at the average age of insurers, the remaining eight insured above 35,—6 of the 8 above 40, and 2 of these 6 above 50.

Of the 145, only 14 were admitted on special terms as under average lives, and with addition to premiums. It may be interesting to look at the future of these fourteen members in detail. 1st, A dyer insured at 18 years, with addition of 5 years to age. Two brothers at 7 and 15 years, and a sister at 7, had died of head affection; his expectation of life was 42 years, he only lived 2. 2d, A watchmaker insured at 35, with addition of 3 years to age; described as "pigeon-breasted and delicate in appearance." His expectation of life was 30 years, and he lived 18. 3d, A writer insured at 20, with addition of 5 years to age. A brother had died of consumption, and a sister of gradual wasting. His expectation of life was 41 years, he survived 5. 4th, A farmer insured at 28, with addition of 3 years to age, "delicate in appearance;" his expectation of life 35 years, his endurance 10. 5th, A solicitor insured at 30, with addition of 5 years to age. Brother had died of pulmonary hæmorrhage at 27. His expectation of life 34 years,—he lived 4. Death was occasioned by hæmorrhage from the lungs. 6th, A shoemaker insured at 24, with addition of 5 years to age. Brother had died of consumption at 19. His expectation of life 38 years,—lived 13. 7th, A clergyman insured at 30, with addition of 5 years to age. One sister had died of consumption at 23, and a second of pleurisy at 19. His expectation of life 34 years,—he lived 3. 8th banker's clerk insured at 26, with addition of 3 years to age. Had an attack of bronchitis before acceptance. His expectation of life 37 years,—lived 17. 9th, A mercantile clerk insured at 24, with 3 years added to age. Brother had died of consumption at 18. His expectation of life 38 years,—endurance of policy, 10. 10th, A clerk insured at 27, with 3 years added to age, "not robust in appearance." His expectation of life 36 years,—he lived 4. 11th, A married woman insured at 38, with 6 years added to age. A brother and sister had died of "glandular disease." Her expectation of life 33 years,—she lived 4. 12th, A merchant insured at 23, with 5 years added to age. A sister had died of consumption. His expectation of life 39 years,—lived 1 year. 13th, A married woman insured at 36, with 5 years added to age. Two sisters, both younger, had died of consumption, and a third in childbed; her expectation of life 30 years,—she lived 3. 14th, A Justice of Peace insured at 34, with 7 years added to age. Mother had died of consumption at 38. Habits of member had not been strictly temperate before marriage. His expectation 31 years,—he lived 12.

Of the 145 claims on account of consumption, the expectation of life was not reached in 140; in only 5 instances was it attained. In several it was very nearly reached.

The most serious losses to the Society under the head of consumption were as follows:—1st, A butcher, æt. 31, died within a year after effecting his assurance. His fatal illness lasted three months. His parents were both living at 80. 2d, A hosier, æt. 21, died within a year of effecting his insurance, after an illness of three months. His family history had one flaw,—a sister having died of diabetes in her fifth year. Personally, he was pronounced eligible by a physician of the very highest reputation and undoubted skill. 3d, A bank clerk, æt. 27, died within a year of acceptance. His personal and family history were faultless. 4th, A grocer, æt. 27, died in the year following his acceptance. His father had died of "uncertain cause" at 30. Proposer himself was styled "not robust, but eligible." 5th, An accountant, æt. 25; 6th, A clerk, æt, 21; and 7th, A merchant, æt. 26. These three died in the course of the year following their acceptance. In each of the three, personal and family history were quite unexceptionable. 9th, Married woman, æt. 39, died of rapid consumption, beginning with uterine derangement, within two years of her acceptance.

Of the 145, *seventy-five* were admitted to the benefits of life assurance after a careful scrutiny of personal and family history, being described as not only free from any consumptive taint, but in both respects eligible. To the remaining *seventy*, a flaw, in the great majority very slight, attached, only fourteen having, as we have already seen, been accepted on special terms. Of the 56 accepted on ordinary terms, although either on personal or family grounds not altogether free from taint,—in 5 the imperfection was personal; in 49 on account of family history; in 2 on both grounds. Of the *five* included under the first head,—one had suffered from congestion of the lungs before acceptance, one from slight bronchitis, two had spat a little blood, and the fifth was not robust in his appearance. In these five the preponderating excellence of the family history overruled all objections to the acceptance of the lives on the ordinary terms of assurance. In the *two* instances in which there existed objections both on personal and family grounds,—1st, proposer had been dyspeptic; and one brother, in a large family, and younger than himself, had died of consumption. 2d, proposer had an attack of bronchitis before acceptance. His father had died at 31 through intemperance, and his mother in childbed. In the *forty-nine* instances in which a flaw existed in the family history alone, the imperfection had been very various in character. In 17 of the 49, a member or members (never more than two in number, and almost invariably younger than proposer) of the immediate family had died of consumption. In 3, the mother of proposer had died shortly after confinement. There is good reason for believing that in females not a few instances of death during confinement, so reported, are cases of consumption, and it is necessary on this account to make as careful an inquiry as possible into the nature and duration of the fatal illness in the mother or sister, as the case may be, of proposers, who have died after the birth of children. In 3 the parents, or one parent, had died at an early period of life of some disease unknown to proposer, raising the suspicion of consumption. In 2 the father died at an early age through intemperance; in 1 the father of proposer committed suicide through intemperance; in 2 the father or mother had died of bronchitis; in 1 a brother died at 18 through exposure; in 1 an aunt died of consumption; in 1 father died at 40, described as "always feeble;" in 1 a brother died through intemperance; in 1 a brother died of kidney disease; in 1 a sister died of diabetes; in 1 mother died at 40, "having had a large family;" in 1 a brother and sister died of "glandular disease;" in 1, brother and sister had spinal disease; in 1, brother and sister died of chest disease, stated expressly not to have been consumption; in 1, sister died, æt. 36, after her confinement.

On a careful review of the deaths from consumption, and more especially of those in which, by reason of some unfavourable circumstance in the personal or family history of the proposer, an addition to the ordinary premium has been charged, it appears abundantly clear that the extra premium imposed has fallen far short of the requirement in every individual case.

The Society's rule not to accept a proposer in whose immediate family more than two members have died of consumption, although on the whole a reasonable, as it unquestionably is a safe one, may admit of exceptions being made. The hereditary character of pulmonary consumption is undoubted, but the disease is not always of this nature, and it may with confidence be affirmed that even in families where several deaths have occurred from consumption, the matter of heredity has by no means been established.

If the proposer have survived, by several years, the age at which consumption proved fatal to his relatives, and possess, as is not very unfrequently the case in consumptive families, an evidently vigorous constitution, he or she may be regarded as an eligible subject for life assurance.

4. *Disease of the Lungs.*—Under this head there appear *fifty-one* emerged risks. All males.

Of these 51, 1 died between 20 and 30; 11 between 30 and 40; 14 between 40 and 50; 6 between 50 and 60; 11 between 60 and 70; 7 between 70 and 80; and 1 above 80.

Three of the 51 were accepted with an additional premium. 1st, Insured at 41, with 5 years added to age on account of chronic bronchial affection; expectation of life 26 years, realization only one year. 2d, Insured at 26, with 5 years added to age, "of a strumous family," died at sea of "congestion of lungs." His expectation was 38 years,—he lived 6. 3d, accepted at 25, with 3 years added to age, "look of delicacy;" expectation 37,—lived 16 years.

"Congestion of lungs" and "chronic disease of lungs" are the terms chiefly employed in the certificates of death included under this head. There can, however, be little doubt that several instances of consumption are ranked under "disease of the lungs."

5. *Hæmoptysis.*—*Three* males. Of these 3, death occurred in 1 at 57; in one at 64; and in 1 at 78. The first survived his expectation period, which was 12 years, by 3 years; the second fell short of that by 2, and the third by 8 years.

6. *Hydrothorax.*—*One* male, æt. 77, insured at 54, survived expectation of 18 years by 5 years.

7. *Laryngitis.*—*Six* males. Of these 6, 2 died between 40 and 50; 1 between 50 and 60; 1 between 60 and 70; and 2 between 70 and 80.

Two of the 6 were instances of acute laryngitis, 4 were chronic, in 2 of the 4 the disease was malignant. In two tracheotomy was performed, the patient in one case surviving the operation for several weeks, in the other for exactly one week.

One of the 6 considerably exceeded his expectation of life; a second nearly equalled it; in a third, the expectation being 30 years, he reached 19; in the three remaining instances, including the two cases of acute laryngitis, the duration of life fell far short of the expectation.

8. *Pleurisy.*—There are *eight* claims on account of pleurisy, all in males. Of these 8, death occurred in 1 between 40 and 50; in 1 between 50 and 60; in 4 between 60 and 70; and in 2 between 70 and 80.

Two of the 8 surpassed their expectation of life, 4 nearly reached it, and 2 fell far short of it.

In 6 of the 8 the disease was of brief continuance. In one, sudden syncope, a not uncommon termination in acute pleurisy, carried off the patient on the fourth day of the disease.

In one of the 8, an extra premium, equivalent to the addition of three years to his age, was charged at the time of acceptance.

9. *Pneumonia.*—*Fifty-five*, being 53 males and 2 females, died from pneumonia.

Of these, 9 died between 30 and 40; 10 between 40 and 50; 16 between 50 and 60; 9 between 60 and 70; 9 between 70 and 80; and 2 between 80 and 90.

Of those above 70, 11 in number, 1st insured at 43, and died at 71; his expectation was 25 years, and he lived 28. 2d insured at 36, and died at 72; his expectation was 30 years, and he lived 36. 3d insured at 54, and died at 80; his expectation was 18 years, and he lived 26. 4th insured at 58, and died at 76; his expectation was 15 years, and he lived 18. 5th insured at 36, and died at 76; his expectation was 30 years, and he lived 40. 6th insured at 43, and died at 74; his expectation of life was 25 years, and he lived 32. 7th insured at 46, and died at 84; his expectation was 25 years, and he lived 38. 8th insured at 51, and died at 77; his expectation was 20 years, and he lived 27. 9th insured at 50, and died at 70; his expectation of life was 14 years, and he lived 20. 10th insured at 36, and died at 78; his expectation of life was 30 years, and he lived 42. 11th insured at 30, and died at 76; his expectation of life was 34 years, and he lived 46.

Adding these years of expectation and of realization of life in the 11 instances now quoted, the result is as follows:—264 years represent their total expectation, and the actual attainment of life reaches 353 years.

By way of contrast.—1st insured at 31; his expectation of life was 33 years, and he lived 1 year. 2d insured at 64; his expectation was 12 years, and he lived 2. 3d insured at 34; his expectation 31 years, and he lived 3. 4th insured at 33; his expectation 32 years, and he lived 2. 5th insured at 32; his expectation 33 years, and he lived 3. 6th insured at 28; his expectation of life was 35 years, and he lived 5.

Adding these years, there results 16 years of actual attainment of life in 6 instances, to be put against 176 years of expectation.

All of these insurers were accepted on the ordinary terms. In one instance the pneumonia is stated to have terminated in abscess of the lung. In some the inflammation of the lung is stated to have been associated with pleurisy.

10. *Quinsy.*—One insurer, at the age of 55, died from quinsy.

V. Diseases of Heart and Bloodvessels.

The total mortality from diseases affecting the organs of circulation has been 324.

Under this class are included the following diseases:—aneurism, disease of heart, pericarditis, and phlebitis.

1. *Aneurism.*—From this cause there are *eight* claims.

Of these 8 insurers, 3 died between 30 and 40; 1 between 40 and 50; 1 between 50 and 60; 2 between 60 and 70; and 1 between 70 and 80.

These were all returned as cases of "aneurism of aorta." In one of the 8, "aneurism or intrathoracic tumour" is entered in the certificate of death. In one instance only was a post-mortem examination made. The subject of it had insured at 52, and died suddenly at 77; his expectation of life was 19 years, and he attained 25. The aneurism was found to have ruptured into the pleura.

In one of the 8 an additional premium was exacted. The proposer was accepted at 35 with five years added to age, his father having died at 55 of Bright's disease, and his mother at 32 of consumption. He died eleven months after effecting his insurance, during five of which he had been complaining.

2. *Disease of Heart.*—Under this head there rank no fewer than *three hundred and eleven* claims, of which 299 are in the person of male insurers, and 12 in that of female.

In 8 of the 311, post-mortem examinations had been made.

In 23 instances death is stated to have occurred "suddenly," or the person was "found dead."

In 26 of the 311, the disease of the heart is certified to have been "fatty degeneration;" in 12, "angina pectoris;" in 23, "valvular disease;" in 2, "endocarditis;" in 3, "gouty, or in connexion with gout;" in 4, "rheumatic, or connected with rheumatic fever"—of course many of the valvular and other cases owed their beginning to this cause; in 6, "dilatation;" in 4, "hypertrophy;" in 1, "softening of the heart;" in 1, "weak heart;" in 2, "disease of heart with profound anæmia."

These taken together amount to 84; in the remaining 227 the certificate of death simply bears "disease of the heart."

In 40 out of the 311, the disease of the heart is stated to have been complicated with dropsy. Disease of liver, congestion of lungs, pulmonary apoplexy, bronchitis, and disease of the kidneys, are mentioned as complications in several cases.

Of the 311 sufferers from heart disease, 2 died under 30 (one of the 2 at 18, the other at 23); 15 between 30 and 40; 35 between 40 and 50; 70 between 50 and 60; 110 between 60 and 70; 68 between 70 and 80; and 11 between 80 and 90.

One of the 2 very early claims relates to a member at 16, who perished at 18 from an attack of pericarditis, endocarditis, and inflammation of heart and lungs in connexion with rheumatism; the other insured at 19, and died at 23, of disease of heart with bronchitis.

Eighty-seven of the 311 insurers who died of disease of the heart exceeded their expectation of life, and other 14 exactly reached it, leaving 210 who fell short of that period.

Of the 87 who exceeded their expectation of life, 1 did so by 21 years, 1 by 17, 2 by 15, 2 by 13, 2 by 12, 3 by 11, 4 by 10, 5 by 8, 7 by 10, 5 by 6, 6 by 5, 8 by 4, 10 by 3, 11 by 2, and 12 by 1.

Of the 14 who exactly equalled their expectation of life, 1 had been insured 34 years; 1, 33 years; 1, 31 years; 1, 30 years; 1, 28 years; 3, 26 years; 1, 23 years; 1, 22 years; 1, 21 years; 1, 15 years; 1, 14 years; and 1, 10 years.

Of the 210 who fell short of their expectation, 12 did so by 1 year, 15 by 2 years, 15 by 3 years, 8 by 4 years, 18 by 5 years, 14 by 6 years, 9 by 7 years, 6 by 8 years, 10 by 9 years, 8 by 10 years, 5 by 11 years, 4 by 12 years, 7 by 13 years, 9 by 14 years, 4 by 15 years, and the remainder by more than 15 and up to 42 years.

It is worthy of note that, among the 87 sufferers from heart disease whose lives continued beyond their expectation period, 11 were merchants; 6, gentlemen of independence; 4, manufacturers; 8, clergymen; 4, writers to the signet; 4, writers; 2, physicians; 3, solicitors; and 2, farmers; and 2 were female insurers. Among the 14 who exactly reached their expectation period, 3 were female insurers, and 2, clergymen. In the list of those who, dying of disease of the heart, fell short of their expectation period, there appear 6 female insurers, 5 commercial agents, 7 clergymen, 26 merchants, 6 drapers, 4 clerks, 5 solicitors, 3 pawnbrokers, 11 medical men, 6 gentlemen of independence, 3 naval officers, 3 gardeners; the remainder under each of the three divisions being made up of the ordinary occupations of life in the single number.

In 15 of the 311 an extra premium was charged at the time of acceptance. These instances may be looked at in detail:—

1st insured at 43; died at 45 from "disease of heart complicated with epilepsy:" expectation of life was 25 years; its realization, 3. On acceptance, 5 years were added to age, because proposer was described as "not strong-looking. Father had died at 40; cause of death unknown; his mother at 65, of cancer."

2d insured at 52; died at 66 from "disease of heart:" expectation of life was 19 years; its realization, 14. On acceptance, 3 years were added to age on account of a previous attack of bronchitis. 3d insured at 40; died at 51 from "valvular disease of heart and general dropsy:" expectation of life was 27 years; its realization, 11. On acceptance, 3 years were added to age, because 12 years previously he had acute rheumatism, at which time "slight pericardial mischief" was noted. 4th insured at 27; died at 33 from "disease of the heart:" expectation of life, 36 years; realization, 7. Three years added to age on acceptance, on account of "a slight cardiac bruit." 5th insured at 53; died at 68 from "disease of heart, and dropsy:" expectation of life, 21 years; realization, 18. Five years added to age on acceptance, because proposer had suffered from sciatica, and had passed a small calculus of oxalate of lime. 6th insured at 34; died at 40 from "disease of heart:" expectation of life, 31 years; realization, 6. Five years had been added to age, because both parents had died under 50. 7th insured at 38; died at 45 from "disease of heart, with bronchitis:" expectation of life, 28 years; realization, 7. Three years had been added to age on acceptance, on account of "cardiac bruit, supposed to be anæmic." 8th insured at 48; died at 69 from "valvular disease of heart;" expectation of life, 22 years; realization, 21. Five years were added to age on acceptance, on account of defective family history. One brother had died of consumption, and a second was suspected to have been affected with the same disease. 9th insured at 40; died at 41: expectation of life, 27 years; realization, 1 year. Three years added to age on acceptance, on account of family history, asthma and bronchitis having proved fatal to two of its members. 10th insured at 34; died at 41 from "disease of heart, with pulmonary complication: expectation of life, 31 years; realization, 7. Five years had been added to age on account of proposer being "subject to winter's cough." 11th insured at 38; died at 63 from "disease of heart, liver, and dropsy:" expectation of life, 28 years; realization, 25. Four years had been added to age on account of proposer being a "reformed drunkard." 12th insured at 53; died at 63 from "disease of heart and kidneys:" expectation of life, 18 years; realization, 11. Five years had been added to age owing to "peculiar pecuniary position" of proposer. 13th insured at 67; died at 80 from "disease of heart with bronchitis:" expectation of life, 10 years; realization, 13. Three years had been added to age on account of proposer being subject to "bronchitis." 14th insured at 32; died at 56 from "disease of heart:" expectation of life, 33 years; realization, 24. Three years had been added to age on account of slight hæmoptysis before acceptance. 14th insured at 49; died at 54 from "disease of heart:" expectation of life, 21 years; realization, 6. Three years had been added to age on account of "very full habit of body."

3. *Pericarditis.*—There were *three* claims, all in male insurers, from pericarditis. Their ages were 48, 38, and 33.

In 1 pericarditis was complicated with pneumonia. On acceptance, the papers, as regards both personal and family history, were quite clear. The expectation of life was 22 years, but he died within 1 year of effecting his insurance. In 2 an acute attack of pericarditis proved fatal on the 5th day. The expectation of life was 38 years, its endurance 13. In 3 pericarditis was complicated with disease of the liver. The papers were quite clear. Expectation of life was 33 years, its endurance only 1 year.

In none of these instances was there any personal or family history of rheumatism in any form.

4. *Phlebitis.*—*Two* males are certified to have died from inflammation of the veins.

1. A surgeon, æt. 42 on acceptance, died at 71; his expectation of life was 26 years, he survived 29. Phlebitis in this case was in the leg, and connected with disease of the liver. 2. Sergeant-major, insured at 40; his expectation of life 27 years, he survived 3.

VI. Diseases of the Digestive Organs.

The total number of deaths from diseases affecting the organs of digestion and assimilation was 190.

Under this class are included ascites, colic, ileus, disease of liver, disease of spleen, disease of stomach and bowels, gastro-enteritis, hæmatemesis, hepatitis, hernia, intussusception, jaundice, perforation of bowels, peritonitis, stricture of bowels.

1. *Ascites.*—Under the head of ascites there are *two* deaths, both in males, ages 55 and 64. Both insurers fell short of their expectation of life, 1 by 17, the other by 2 years.

2. *Colic or Ileus.*—*Eight* insurers, 7 males and 1 female, perished from this cause. Their ages were 53, 57, 58, 62, 63, 63, 65. All fell short of their expectation of life, 1 by 2 years, 1 by 5 years, 1 by 6 years, 1 by 7 years, 1 by 8 years, 1 by 10 years, and 1 by 16 years.

One was accepted at an advance of three years to age on account of "not having been strong;" he lived six instead of eleven years. One was a gout risk, having had two attacks of gout previous to acceptance; he lived eleven in place of eighteen years.

3. *Disease of Liver.*—*Ninety-nine* deaths, of which 95 occurred in males and 4 in females, are returned under the head of disease of liver. To these may be added three cases of undoubted cancer of the liver placed under cancer in class 2 and 4 of hepatitis, to be adverted to immediately.

By so doing the deaths from disease of the liver in the experience of the Society have been 106. Of the 99, 12 died between 30 and

40; 20 between 40 and 50; 32 between 50 and 60; 24 between 60 and 70; 8 between 70 and 80; and 3 between 80 and 90.

The ninety-nine instances of disease of the liver may be tabulated from the returns as follows:—

Disease of liver with ascites, 9; disease of liver with dropsy, 11; acute disease of liver, resulting from impacted gall-stone in cystic duct, 1; disease of liver and dropsy, kidneys affected, 1; disease of liver and stomach, 1; cirrhosis of liver, 6; disease of liver with diarrhœa, 3; disease of liver, 38; disease of liver and spleen, fatal hæmatemesis, 1; disease of liver and spleen, 1; disease of liver and kidneys, 5; fatty disease of liver, 1; disease of liver, fatal hæmatemesis, 1; disease of liver, jaundice, 5; disease of liver, bronchitis, 1; disease of liver, complicated with epilepsy, 1; disease of liver, abscess, rupture into pleura and abdomen, 1; disease of liver, complicated with carbuncle, 1; disease of liver, abscess, 2; disease of liver, enlargement, 1; disease of liver and lungs, 3; disease of liver, enlargement, with dropsy, 1; disease of liver, pyæmia, 1; inflammation of liver, 1; congestion of liver, 1; rupture of abscess in liver, 1; in all, 99.

In five an extra premium was charged, namely:—

(1.) Gentleman, æt. 51 on acceptance, died at 54. Expectation of life 20 years, lived 3. Had gout previous to insurance. Gout extra equivalent to addition of three years to age was charged. Certificate of death bore "Disease of liver."

(2.) Clerk, æt. 53 on acceptance, died at 56. Expectation of life 18 years, lived 3. Had internal bleeding piles before acceptance. Three years were added to age. Died of "Enlargement of liver and dropsy."

(3.) Draper, æt. 35 on acceptance, died at 52. Expectation of life 30 years, lived 19. He had frequent attacks of dyspepsia. Three years added to age. Died of "Disease of liver and dropsy."

(4.) Coal-master, æt. 45 on acceptance, died at 53. Expectation of life 24 years, lived 8. Mother had died of consumption. Five years added to age. Died of "Disease of liver."

(5.) Commercial traveller, æt. 36 on acceptance, died at 37. Expectation of life 30 years, lived 2. Had been anæmic, with disturbed action of heart. Five years added to age. Died of "Disease of liver and jaundice."

Of the ninety-nine sufferers from liver disease, 14 were closely connected with the manufacture or sale of intoxicating liquors, and three were commercial travellers, a class notoriously of intemperate habits.

The bearing of habits on the production of liver disease may be further seen from the following facts culled from the same list:—

1. *Gentleman* certified on acceptance as "strictly temperate," endurance of policy 6 years in place of 28. At decease, declared to have been a dipsomaniac for years. 2. *Flesher*, "more than twelve months intemperate before death." 3. *Colliery manager*, "had lived very freely." 4. *Agent*, "lived very freely."

Of the ninety-nine, 15 exceeded the expectation of life, 3 equalled it, and 81 fell short of it.

4. *Disease of Spleen.*—*One* male insurer died of disease of the

spleen, æt. 57. He was accepted at 34, his expectation of life being then 31 years; the endurance of the policy was 23 years. The fatal illness lasted twelve months.

5. *Disease of Stomach and Bowels.—Twenty-five* claims are included under this head, 24 males and 1 female.

The ages of these twenty-five insurers were at death as follows:—2 between 20 and 30; 1 between 30 and 40; 6 between 40 and 50; 6 between 50 and 60; 7 between 60 and 70; and 3 between 70 and 80.

In 3 of the twenty-five, the expectation of life was exceeded by the endurance, in 1 by 2 years, in 1 by 3, and in 1 by 9 years. In 1 the expectation and realization were exactly equal, and in 21 the endurance fell short of the expectation, in 1 by 1 year, in 2 by 2 years, in 1 by 4 years, in 1 by 5 years, in 1 by 6 years, in 2 by 7 years, in 1 by 9 years, in 1 by 10 years, in 1 by 11 years, in 1 by 13 years, in 2 by 15 years, in 1 by 19 years, in 1 by 20 years, in 2 by 21 years, in 1 by 28 years, in 1 by 35, and in 1 by 40 years.

The twenty-five cases are thus described:—

Ulcer of stomach, perforation and peritonitis, 1; disease of stomach, 11; gastritis, 1; disease of bowels, 1; mesenteric disease, 1; stricture of œsophagus, 1; disease of rectum, 1; ulcer of duodenum, 1; perforating ulcer of bowels, 1; ulcer of stomach, 2; inflammation of stomach, 2; disease of bowels, diarrhœa, 1; disease of stomach, hæmatemesis, 1; in all, 25.

In three of the twenty-five a post-mortem examination was made. 1st, Clergyman insured at 25. Expectation of life, 37; actual endurance, 17. He died, æt. 45, of "ulcer of stomach, perforation, and peritonitis;" fatal illness lasted 22 hours. 2d, Merchant, insured at 56. Expectation of life, 16 years; actual endurance, 18; died at 73, "ulcer of duodenum;" had symptoms of the disease for four years. 3d, Broker, insured at 29. Expectation, 34 years; actual endurance, 25; died at 53, "disease of stomach."

Cases of disease affecting stomach and bowels, styled cancer, have been placed under the head of cancer in Class II.

6. *Gastritis-Enteritis.*—Under this head *eight* claims are returned, 6 in males, and 2 in females.

The ages of the eight were 28, 29, 44, 47, 61, 73, 75, and 77; of these, 3 exceeded their expectation period by 6, 7, and 8 years respectively; and 5 fell short of it by 5, 18, 19, 32, and 34 years.

The disease was styled acute in five instances—2 days, 3 days, 5 days, 8 days, and 12 days being mentioned as the duration of the fatal illness in these. In one the duration is described as many months, in two the duration is not mentioned.

7. *Hæmatemesis.—Eight* claims occur from this cause, 7 in males, and 1 female. Ages 34, 35, 46, 54, 55, 57, 60, and 70. All fell

short of expectation by 1, 4, 10, 14, 19, 26, and 30 years respectively.

One case is described as hæmatemesis occurring in the course of fever, and another in a person of 70 years of age, as due to arterial degeneration. There can be little doubt that under the names of disease of the liver, and more particularly cirrhosis, and ulcer of the stomach, these instances of fatal hæmatemesis would have been more correctly classed.

8. *Hepatitis* accounts for *four* deaths, 3 males and 1 female. Ages at death, 31, 49, 67, and 77. One of the four exceeded expectation by 6 years; 1 equalled, and 2 fell short of expectation—1 by 10, the other by 13 years. As none of the four cases of so-called hepatitis occurred in warm climates, it is very likely that the use of the term is erroneous.

9. *Hernia.*—The claims on account of hernia have been *six*, 3 in males, and 3 in females.

Ages, 50, 64, 72, 80, at which age there were two, and 84. Two fell short of expectation of life, 1 by 4, the other by 11 years; 4 exceeded expectation by 5, 7, 11, and 16 years respectively.

The length of fatal illness is stated to have been 18 hours in 1; a day in 1; 3 days in 1; 5 days in 2; and 2 weeks in 1; this was a case of strangulated umbilical hernia, and occurred in a female aged 84.

10. *Intussusception.*—*Six* insurers died from this cause; they were all males, of the ages 41, 43, 60, 61, 74, and 85. In two of these the expectation of life was exceeded, in 1 by 7, in the other by 10 years. In four the expected age was not reached, in two by 7, and in two by 22 years.

The illness proved fatal in 1 case in 4 days; in 2 cases in 6 days; 1 in 7 days; in 1 in 10 days; and in the 6th case the duration of the illness is not stated. In the case of an insurer, æt. 29 at the time of his acceptance, and 41 at death, the fatal obstruction occurred during an attack of delirium tremens.

11. *Jaundice.*—There are *four* deaths recorded under the head of jaundice. Of these 3 occurred in males, and 1 in a female. Happily this name, which is that of a symptom and not of a disease, is disappearing from our nosological registers.

The ages of these victims were 61, at which age two deaths occurred, 62, and 64; all fell short of their expectation of life, 1 by a single year, 2 by 6, and 1 by 7 years.

12. *Perforation of Bowels.*—From this there resulted *three* deaths, in male insurers. Ages 32, 57, and 65. All fell short of their expectation period, 1 by 2 years, 1 by 8, and 1 by 29. One case was styled "chronic ulceration of bowels, with perforation;" a

second simply "perforation," 24 hours ill; the third, "perforation consequent upon obstruction," 12 days ill.

13. *Peritonitis.*—There appear *twelve* deaths from peritonitis, 11 males and 1 female. Ages 34, 37 (2 deaths), 45, 47 (2 deaths), 53, 54, 57, 58, 65, and 78. In 1, expectation was exceeded by 11 years; in 1 exactly attained; and in the remaining 10 the duration of life fell short of expectation by 9, 10, 11, 12, 20, 22, 25, 28, and 29 years.

Two of the 12 had been accepted with an extra premium; one of 5, the other of 3 years.

1*st*, a wharfinger, was accepted, æt. 24, with 5 years added to age; described as "not robust," had diarrhœa with bloody flux the year before acceptance; family history good; died at 31, of tubercular peritonitis, after an illness of 5 or 6 months.

The 2*d*, a manufacturer, accepted æt. 29, with 3 years added to age, mother having died of pulmonary disease; died at 34, after an illness of 30 hours, simply styled "peritonitis."

Of the 12 cases the disease was *acute* in 8; of the 8, 1 died in 22 hours; 1 in 24; and 1 in 30; 1 in 2 days; 1 in 5; and 2 in 10. In 3 the disease was *chronic;* in one the illness lasted 1 month; in one 5 or 6 months; and in one 7 months. In one the duration of the illness is not specified.

14. *Stricture of the Bowels.*—This proved fatal to *four* insurers, 3 males and 1 female. Their ages at death were 45, 62, 66, and 75.

One of the four, a corn-merchant, insured at 45, his expectation of life being 24 years. The papers were quite clear, but he died within a year after effecting his assurance from "stricture of the small intestine." A second, a merchant, insured at 49; his expectation of life being then 21 years; he died at 66, of "stricture of bowel causing obstruction." A third, Mrs ——, insured at 47; her expectation being 23 years; died at 62. The fourth, a postmaster, insured at 37, his expectation being 29 years; he died at 75, having exceeded the period of his calculated survivancy by 10 years.

VII. DISEASES OF THE URINARY ORGANS.

The total number of deaths from diseases of the urinary organs was 116.

Under this class are included, cystitis, disease of bladder, disease of kidneys, disease of prostate gland, fistula in perineo, hæmaturia, and ischuria.

1. *Cystitis.*—From this disease there died *eleven* males; 2 died between 40 and 50; 2 between 50 and 60; 2 between 60 and 70; and 5 between 70 and 80.

In 5 of the 11 the period of expectation of life was exceeded, and in 6 it was not attained. In one case the inflammation was accompanied by hæmorrhage.

2. *Disease of Bladder.—Sixteen* deaths, all in males, are thus recorded. Of these 2 died between 80 and 90; 4 between 70 and 80; 7 between 60 and 70; 2 between 50 and 60; and 1 between 30 and 40. Eight of the 16 exceeded, and 8 fell short of their expectation period. In 2, a post-mortem examination was made, but no further details are given in either report of these cases.

In 7 of the 16 there existed *stone in the bladder*, and in 3 of the 7 lithotomy had been performed. The ages of the 3 were 64, 67, and 68.

In 1, rupture of the bladder occasioned death. In the remaining 8, acute and chronic disease of the bladder is assigned as the cause of death.

3. *Disease of Prostate Gland.—Twelve* members died from this disease.

Of these 12, 1 died at 86, 6 between 70 and 80; and 5 between 60 and 70. In 8, expectation of life was surpassed; in 4, it was not reached. In 1, the insurer survived his expectation by 17 years; insured at 45 years of age, he died at 86. In 3 of the 12, stricture of the urethra coexisted with disease of the prostate.

In 1, retention of urine was the immediate cause of death.

4. *Disease of Kidneys* (Renal Disease).—From this cause there died *seventy-three*, 71 males and 2 females. Of the 73, death occurred between 20 and 30 in 1; between 30 and 40 in 8; between 40 and 50 in 13; between 50 and 60 in 16; between 60 and 70 in 28; between 70 and 80 in 7.

In 61, the realization of life fell short of its expectation, in 10 the latter was exceeded, and in 2 nearly equalled.

Three of the 73 were accepted with an extra premium, in each equivalent to the addition of 3 years to age.

1*st*, An agent, insured at 50, died at 66; his expectation of life was 21 years, he lived 16. 2*d*, A solicitor, insured at 42, died at 53; his expectation 26 years, he lived 12. 3*d*, A commercial traveller, insured at 33, died at 49; his expectation was 32 years, he lived 17.

In a fourth case, an extra premium on account of gout was charged.

In only one of the 73 was a post-mortem examination made.

The cases of renal disease may be tabulated as follows:—

Acute disease of kidneys, 3; chronic disease of kidneys, 41; disease of kidneys and dropsy, 4; disease of kidneys with heart disease, 3; Bright's disease, 16; pyelitis, 1; malignant disease of left kidney, 1; albuminuria, 2; renal calculus, 1; nephritis, 1.

Among the occupations of those who died of disease of the kidneys there appear—grocers, hotel-keepers, brewers, spirit-dealers, and commercial travellers, all of which may be considered as favouring the consumption of alcoholic drinks. Gentlemen of independence, clergymen, medical men, lawyers, officers of army and navy retired, bankers, manufacturers, and various other occupations, are likewise represented.

5. *Fistula in Perineo.*—*One* male, A barrister, insured at 36, died at 67; expectation of life, 30 years; realization, 32.

6. *Hœmaturia.*—*One* male, Governor of debtors' prison, insured at 36, died at 63; expectation of life, 30 years; survived, 28. Fatal illness was consequent upon an attack of pleuro-pneumonia.

7. *Ischuria.*—*Two* males. *1st*, Schoolmaster, insured at 26, died at 36; expectation 37 years, only survived 10 years. Fatal illness lasted forty-eight hours. *2d*, Agent for Lloyds, insured at 57, died at 80; expectation of life 16 years, its realization 24. Fatal illness lasted 10 days.

VIII. DISEASES OF THE ORGANS OF GENERATION.

The total number of deaths recorded under this class is *five*.

1. *Childbirth.*—From this cause there were 4 female deaths. The ages of the 4 were 46, 42, 36, and 29.

Two of the four were joint-assurances with husbands, payable at the death of first.

One of the four survived acceptance 8 years, her expectation of life being 34 years. The other 3 only survived acceptance 2 years each—36, 27, and 25 being respectively the expectation period in these three.

In one instance placenta prævia existed with flooding. Delivery was accomplished by turning the child. Death occurred one hour after delivery was completed. This lady was accepted in the fourth month of her third pregnancy. Her previous labours had been quite natural. She perished at the close of her fourth pregnancy, at the age of 42.

In one case rupture of the uterus took place during delivery; this lady was 36.

In the third case a lady died on the seventh day after delivery, of septicæmia. She was 5 months pregnant when proposal of assurance was first made in December 1869, and that proposal was declined. Previous pregnancies, 3 in number, had been natural. She died æt. 36.

In the fourth, syncope occurred 3 hours after parturition.

The Society's rule is now rigidly adhered to, not to accept the life of a pregnant female, however unexceptional in every other respect. To this rule it has been objected that every married female proposing an insurance within the child-bearing period, although not pregnant at the time, may become so; and no doubt this argument has weight. It appears, however, reasonable to decline assurance benefits to those who, as in the instance of a pregnant female, present at the time a decidedly increased risk.

2. *Disease of Uterus.—One* female. Married lady, accepted at 36, died at 50; her expectation of life was 30 years, its endurance 14. Stated to have died of disease of the uterus "of years' standing."

Six cases of cancer of the womb, and one of ovarian disease, are included in Class II.

IX. DISEASES OF THE ORGANS OF LOCOMOTION.

The total number of claims recorded under this head are *thirty-four.*

1. *Arthritis.—One* male. An auctioneer, insured at 41; died at 72; expectation of life 26, endurance 31 years. "Chronic arthritis" entered as the cause of death in certificate.

2. *Disease of Foot.—One* male. A clergyman, insured at 41, died at 45; expectation of life, 26 years, its endurance 4. Amputation had been performed on account of disease.

3. *Disease of Joint.—Four* males. Ages of four at death, 48, 48, 58, and 72. Nature of disease in 1. Malignant disease of knee-joint; 2. Necrosis of femur at knee; 3. Acute necrosis of femur, with disease of knee-joint, only 2 weeks ill; 4. Strumous disease of knee-joint.

One of the 4 survived his expectancy by 5 years; and 3 fell short of that period by 31, 18, and 14 years respectively.

4. *Disease of Spine.—Eight* males. Ages of the 8 at death, 38, 54, 54, 56, 59, 61, 65, 70. One of these only exceeded expectation of life, and that by 5 years. In the remaining 7 the endurance of policy fell short of expectation by 27, 12, 11, 9, 6, 3, and 2 years respectively.

The nature of the disease is specified in the individual certificates of death as follows:—Disease of spine, 3; Caries of dorsal vertebræ, 1; Caries of vertebral column, with abscesses,—convulsions of epileptic character, 1; Injury to spinal cord and spine, 1; Disease of spine, kidneys, and bladder, 1; Spondylarthrocace, 1.

5. *Rheumatism.*—From rheumatism there died *twenty,* 18 males and 2 females.

The age at death of the 20 was as follows:—1 between 20 and 30; 3 between 30 and 40; 4 between 40 and 50; 4 between 50 and 60; 6 between 60 and 70; and 2 between 70 and 80.

In 16 the endurance of life fell short of expectation, in 2 equalled, and in 2 exceeded.

The fatal disease is styled *rheumatic fever* or acute rheumatism in 14, and in 4 of the 14 it is stated that the heart was affected. In 3 there was brain complication, and in 2 pulmonary.

In 4 of the 20, the disease is called *chronic rheumatism.* In 1 of the four, syphilis is stated to have existed in combination with rheumatism. In the remaining 2, the disease is simply designated *rheumatism.*

In one instance there was a post-mortem examination.

In 2 of the 20 an additional premium was charged—1. Æt. 34 on acceptance, died at 37. Seven years were added to age because father had died of paralysis at 57, and brother of consumption at 22. 2. Æt. 47 on acceptance, died at 61. Three years were added to age on account of liability to diarrhœa.

X. DISEASES OF INTEGUMENTARY SYSTEM.

The total number of deaths ranked under this class is ten.

1. *Carbuncle.—Nine* males. Ages at death, 37, 49, 50, 55, 56, 60, 66, 72, and 80. In 7 endurance fell short of expectation, and in 2 exceeded it; in one of these two by 17 years.

2. *Pemphigus.—One* male. A merchant, insured at 55, died at 89; his expectation of life was 17 years, his realization 35.

XI. VIOLENT DEATHS.

In number *Fifty-three.* 52 males and 1 female.

In four of the fifty-three, endurance of life exceeded expectation. In the remaining forty-nine it fell short; in many instances lamentably short.

The class forms a dismal catalogue of tragedy and disaster. The fifty-three deaths admit of a division into accidental and suicidal; of the former there were 46, of the latter 7.

1. *Accidental Deaths.*—These 46 deaths may be classified as follows:—

a. Drowning (1 of the 4 while fishing, 1 while diving), 4; *b.* Crushed to death by wheel, 1; *c.* Suffocation while eating a beef-steak in railway refreshment rooms, two portions found in œsophagus, 1; *d.* Bursting of boiler on board steamship, 1; *e.* By fall of house during violent gale, 24th January 1868, 1; *f.* Run over by engine on railway, 1; *g.* Fall from railway train in motion, 1; *h.* Fall from steamship into sea (while intoxicated), 1; *i.* By falls down stairs, from roof, or through floor, or otherwise, including 3 falls in very old persons, 13; *j.* By fall from gig, dogcart, carriage, or other conveyance, 4; *k.* By fall from horseback, 2; *l.* By exposure in bush, Australia, 1; *m.* Lost at sea, 5; *n.* By discharge of gun, 2; *o.* Burn, 1; *p.* By suffocation when intoxicated, found dead lying on his face, 1; *q.* Not detailed, 6.

2. *Suicidal Deaths.*—Five of the 7 were insane at the time of committing the rash act. In 4 of the 5 the verdict of insanity was returned by a coroner's jury. In other 2 of the 7 the plea of insanity could not be supported.

The mode of suicide was cutting of throat, 1; pistol wound of head, 1; pistol wound in right lung, 1; gun-shot wound of head, 1; hanging, 2; poisoning by laudanum, 1.

XII. OLD AGE AND NATURAL DECAY.

The total number of deaths classed under this head is *seventy-four*, of which number 64 are males and 10 females.

Of the 74, 3 were at death above 90 years; 48 were between 80 and 90; 22 were between 70 and 80; and one was 68.

In 71 of the 74 the expectation of life was exceeded; in 1 endurance of policy exactly equalled expectation, in 2 the expectation was not realized.

Take the three deaths of insurers above 90:—

1. Insured at 51, lived to 91; his expectation of life was 20 years, his realization 41.
2. Insured at 58, lived to 91; his expectation of life was 15 years, his realization 33.
3. Insured at 64, lived to 91; his expectation of life was 12 years, his realization 27.

Complications are stated to have existed in 13 of the 74, but in all *old age* is assigned as the cause of death.

Of these 13, dropsical swelling existed in 2; chronic rheumatism in 1; urinary irritation in 1; biliary derangement in 1; congestion of brain in 1; cancer of lip in 1; shingles and gout in 1; bronchitis in 1; cold in 1; death hastened by a fall in 1; sudden syncope in 1.

It is interesting to notice the age at which assurance was first effected in these long livers. Forty-two insured above 50 years of age, and 32 below 50.

In the two instances in which death occurred within the expectation period—1. Was insured at 71; his expectation of life was then 8 years, he lived 5. 2. Was insured at 67; his expectation was 10 years, he lived 8. In the single instance in which the expectation period was exactly reached, the insurance took place at 51; expectation was then 20 years, he lived to 71.

Among these long survivors many occupations and positions in life are represented; 10 were females, 5 clergymen, 6 gentlemen of independence, 4 medical men, 8 merchants, 5 agents, 3 lawyers, 2 bankers, 3 manufacturers, 3 retired officers of army and navy.

XIII. CAUSE OF DEATH NOT ASCERTAINED.—2 MALES.

1. A miller insured at 30 years; his expectation 34, endurance of policy 18. Claim allowed in the 48th year of insurer's life. "Disappeared," supposed to be dead, from 12th November 1868.
2. Gentleman retired from business, died in New Zealand at the age of 72, probably of senile fever, but the cause of death has not been accurately ascertained. His age at entry was 43; his expectation of life 25 years, and he lived 30.

It is gratifying to find only two instances out of 1928 claims in which the cause of death has not been satisfactorily ascertained.

TABLE No. I.*

Showing the Causes of Death among the Assured of the SCOTTISH WIDOWS' FUND LIFE ASSURANCE SOCIETY,

From 1867 *to* 1873, *both inclusive.*

CAUSES OF DEATH.	AGE AT DEATH.							TOTAL.
	All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
1. *Epidemic, Endemic, and Contagious Diseases.*								
Cholera,	2	...	...	1	1	...	..	4
Diarrhœa,	...	...	1	...	4	7	1	13
Diphtheria,	2	2	...	1	1	...	...	6
Dysentery,	...	1	1	2	1	...	2	7
Erysipelas,	...	2	1	4	6	2	...	15
Fever,	10	20	9	9	9	6	6	69
Influenza,	1	...	...	...	...	2	2	5
Measles,	...	1	...	...	...	...	...	1
Scarlatina,	...	4	...	...	...	...	...	4
Small-pox,	3	7	2	4	1	1	...	18
2. *Uncertain Seat.*								
Abscess,	1	...	2	2	3	...	...	8
Addison's Disease,	...	...	1	...	...	...	...	1
Atrophy,	...	...	...	1	3	...	...	4
Cancer,	1	3	17	25	30	12	...	88
Debility,	...	1	3	4	3	8	3	22
Diabetes,	2	1	3	5	8	2	1	22
Dropsy,	...	...	1	3	1	2	...	7
Gout,	...	...	...	3	3	1	...	7
Hæmorrhage,	...	2	1	...	1	...	...	4
Inflammation,	...	...	...	...	...	1	...	1
Leukæmia,	...	...	...	1	...	...	...	1
Mortification,	...	...	...	1	...	3	2	6
Pyæmia,	...	...	2	1	1	1	...	5
Sudden Deaths,	...	...	1	1	...	1	...	3
Ulcer,	...	...	...	...	1	...	...	1
3. *Nervous System.*								
Apoplexy,	1	10	17	29	39	16	8	120
Cephalitis,	2	...	...	1	...	2	...	5
Carry forward,	25	54	62	98	116	67	25	447

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* The following Tables have been prepared by Mr. WILLIAM BRAID, the Assistant Actuary of the Society, to whom I am also indebted for valuable assistance in the preparation and revision of the Report.

TABLE No. I.—*Continued.*

CAUSES OF DEATH.	AGE AT DEATH.							TOTAL
	All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
Brought forward, ...	25	54	62	98	116	67	25	447
Chronic Alcoholism, ...	...	1	1	1	...	...	...	3
Delirium Tremens, ...	1	3	1	2	1	1	...	9
Disease of Brain, ...	2	14	15	21	28	31	7	118
Epilepsy, ...	2	1	4	2	2	...	1	12
Hemiplegia, ...	...	...	1	1	1	5	1	9
Insanity, ...	...	1	1	2	...	...	...	4
Locomotor Ataxy, ...	...	...	1	...	1	1	...	3
Meningitis, ...	...	1	...	2	1	1	...	5
Nervous Exhaustion, ...	...	...	...	...	1	1	...	2
Paralysis, ...	...	5	6	22	28	36	5	102
Paraplegia, ...	...	...	...	1	...	...	...	1
Sunstroke, ...	1	...	...	...	...	1	...	2
4. *Respiratory Organs.*								
Asthma, ...	...	...	...	3	2	3	...	8
Bronchitis, ...	2	2	15	29	30	33	14	125
Consumption, ...	25	46	42	21	8	3	...	145
Disease of Lungs, ...	1	11	14	6	11	7	1	51
Hæmoptysis, ...	...	...	...	1	1	1	...	3
Hydrothorax, ...	...	...	...	...	...	1	...	1
Laryngitis, ...	...	...	2	1	1	2	...	6
Pleurisy, ...	...	...	1	1	4	2	...	8
Pneumonia, ...	...	9	9	16	10	9	2	55
Quinsy, ...	...	...	...	1	...	...	...	1
5. *Organs of Circulation.*								
Aneurism, ...	...	3	1	1	2	1	...	8
Disease of Heart, ...	2	15	35	70	110	68	11	311
Pericarditis, ...	...	2	1	...	...	...	...	3
Phlebitis, ...	...	...	1	...	...	1	...	2
6. *Digestive Organs.*								
Ascites, ...	...	...	...	1	1	...	...	2
Colic or Ileus, ...	...	...	...	3	5	...	...	8
Disease of Liver, ...	...	12	20	32	24	8	3	99
Disease of Spleen, ...	...	...	...	1	...	...	...	1
Disease of Stomach and Bowels, ...	2	1	6	6	7	3	...	25
Gastritis-Enteritis, ...	2	...	2	...	1	3	...	8
Hæmatemesis, ...	...	2	1	3	1	1	...	8
Hepatitis, ...	...	1	1	...	1	1	...	4
Hernia, ...	...	...	...	1	1	1	3	6
Intussusception, ...	...	...	2	...	2	1	1	6
Carry forward, ...	65	184	245	349	401	293	74	1611

TABLE No. I.—*Continued.*

CAUSES OF DEATH.	AGE AT DEATH.							TOTAL.
	All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
Brought forward, ...	65	184	245	349	401	293	74	1611
Jaundice, ...	...	...	...	...	4	...	...	4
Perforation of Bowels, ...	...	1	...	1	1	...	...	3
Peritonitis, ...	...	3	3	4	1	1	...	12
Stricture of Bowels, ...	...	...	1	...	2	1	...	4
7. *Urinary Organs.*								
Cystitis, ...	...	...	2	2	2	5	...	11
Disease of Bladder, ...	...	1	...	2	7	4	2	16
Disease of Kidneys, ...	1	8	13	16	28	7	...	73
Disease of Prostate Gland,	...	...	...	...	5	6	1	12
Fistula in Perineo, ...	...	...	...	...	1	...	...	1
Hæmaturia, ...	...	...	...	...	1	...	...	1
Ischuria, ...	...	1	...	...	...	...	1	2
8. *Organs of Generation.*								
Childbirth, ...	1	1	2	...	...	...	...	4
Disease of Uterus, ...	...	...	...	1	...	...	...	1
9. *Organs of Locomotion.*								
Arthritis, ...	...	...	...	...	...	1	...	1
Disease of Foot, ...	...	...	1	...	...	...	...	1
Disease of Joint, ...	...	...	2	1	...	1	...	4
Disease of Spine, ...	...	1	...	4	2	1	...	8
Rheumatism, ...	1	3	4	4	6	2	...	20
10. *Integumentary System.*								
Carbuncle, ...	...	1	1	3	2	1	1	9
Pemphigus, ...	...	...	...	...	...	...	1	1
11. *Violent Deaths,*	4	15	10	12	9	2	1	53
12. *Old Age and Natural Decay,*	...	...	...	...	1	22	51	74
13. *Cause not ascertained,*	...	...	1	...	...	1	...	2
Totals, ...	72	219	285	399	473	348	132	1928

TABLE No. II.

Showing the Causes of Death among the Assured of the SCOTTISH WIDOWS' FUND LIFE ASSURANCE SOCIETY,

From 1815 to 1873 inclusive.

Arranged as nearly as possible according to the Classification of the Registrar-Gene

CLASS AND ORDER.	CAUSES OF DEATH.	AGE AT DEATH.							TOTAL.
		All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
I. Order 1.	ZYMOTIC DISEASES. *Miasmatic.*								
	Small-pox,	6	10	4	5	1	1	...	27
	Measles,	...	1	...	...	...	...	...	1
	Scarlatina,	1	9	6	1	...	...	...	17
	Diphtheria,	2	2	...	1	1	1	...	7
	Quinsy,	...	...	1	1	1	...	...	3
	Fever,	27	71	75	77	48	12	8	318
	Erysipelas,	2	6	9	12	13	10	2	54
	Carbuncle,	...	1	2	6	3	2	1	15
	Influenza,	1	1	4	3	10	13	4	36
	Dysentery,	3	3	7	9	18	6	3	49
	Diarrhœa,	1	2	3	8	10	16	2	42
	Cholera,	6	7	14	23	11	2	...	63
	Ague,	...	...	1	...	...	...	...	1
	Rheumatism,	1	7	10	8	9	2	...	37
	Total,	50	120	136	154	125	65	20	670
Order 2.	*Enthetic.*								
	Hydrophobia,	...	...	...	1	...	...	...	1
	Total,	...	...	...	1	...	...	...	1
Order 3.	*Dietic.*								
	Purpura,	...	...	1	...	...	...	...	1
	Delirium Tremens,	3	11	15	7	3	1	...	40
	Chronic Alcoholism,	...	1	1	1	...	...	...	3
	Total,	3	12	17	8	3	1	...	44
	Class I.—Total,	53	132	153	163	128	66	20	715
II. Order 1.	CONSTITUTIONAL. *Diathetic.*								
	Gout,	...	2	1	11	8	4	1	27
	Dropsy,	...	2	5	12	6	5	...	30
	Cancer,	2	6	34	45	62	18	2	169
	Carry forward,	2	10	40	68	76	27	3	226

TABLE No. II.—*Continued.*

CLASS AND ORDER.	CAUSES OF DEATH.	AGE AT DEATH.							TOTAL.
		All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
II.	Brought forward,...	2	10	40	68	76	27	3	226
Order 1.	Mortification, ...	1	1	1	6	11	5	2	27
	Inflammation, ...	...	...	1	...	2	1	1	5
	Hæmorrhage, ...	1	4	3	2	2	2	...	14
	Tumour, ...	...	2	1	6	4	3	...	16
	Abscess, ...	1	2	6	4	3	1	...	17
	Total, ...	5	19	52	86	98	39	6	305
Order 2.	*Tubercular.*								
	Scrofula, ...	...	...	1	...	...	...	...	1
	Phthisis, ...	62	135	115	75	30	4	...	421
	Hæmoptysis, ...	...	...	...	3	1	1	...	5
	Total, ...	62	135	116	78	31	5	...	427
	Class II.—Total,...	67	154	168	164	129	44	6	732
III.	LOCAL.								
Order 1.	*Nervous System.*								
	Cephalitis,..............	5	11	17	14	7	2	1	57
	Apoplexy,..............	5	26	62	101	123	53	17	387
	Paralysis,..............	1	12	23	63	87	103	16	305
	Hemiplegia,...........	...	...	1	1	1	5	1	9
	Paraplegia, ...	...	...	...	1	...	1	...	2
	Insanity, ...	...	4	5	5	...	1	...	15
	Epilepsy, ...	2	4	9	6	2	2	1	26
	Convulsions, ...	...	...	1	1	...	...	...	2
	Brain Disease,.........	9	43	78	77	86	60	10	363
	Meningitis, ...	...	1	...	2	1	1	...	5
	Spinal Marrow Disease, ...	...	...	...	1	...	...	...	1
	Locomotor Ataxy, ...	...	...	1	...	1	1	...	3
	Nervous Exhaustion,	...	...	...	...	1	1	...	2
	Sunstroke,.............	1	...	...	...	...	1	...	2
	Tetanus, ...	...	...	2	2	...	...	...	4
	Total,......	23	101	199	274	309	231	46	1183
Order 2.	*Organs of Circulation.*								
	Pericarditis,...........	...	5	4	1	2	...	...	12
	Aneurism,..............	...	6	10	13	16	1	2	48
	Heart Disease,.........	3	40	94	187	248	143	22	737
	Phlebitis,...............	...	...	1	...	...	1	...	2
	Leukæmia, ...	...	...	...	1	...	...	...	1
	Total,......	3	51	109	202	266	145	24	800

TABLE No. II.—*Continued.*

CLASS AND ORDER.	CAUSES OF DEATH.	AGE AT DEATH.							TOTAL
		All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
III. Order 3.	*Respiratory Organs.*								
	Laryngitis, ...	...	4	6	2	5	3	...	20
	Bronchitis, ...	4	12	34	63	85	85	31	314
	Pleurisy, ...	1	3	6	5	10	3	..	28
	Pneumonia, ...	1	20	33	50	32	24	5	165
	Asthma, ...	...	1	1	6	4	4	...	16
	Lung Disease, ...	4	25	33	36	29	17	5	149
	Hydrothorax, ...	...	1	9	9	8	6	2	35
	Total,... ..	10	66	122	171	173	142	43	727
Order 4.	*Digestive Organs.*								
	Gastritis-Enteritis,...	4	6	9	10	7	5	...	41
	Peritonitis, ...	5	5	9	7	4	1	...	31
	Ascites, ...	...	...	...	1	1	...	...	2
	Ulceration of Intestines, ...	...	3	4	1	4	2	...	14
	Perforation of Intestines, ...	...	1	1	1	1	1	...	5
	Hernia, ...	...	1	1	1	2	1	5	11
	Ileus, ...	...	2	3	7	9	5	...	26
	Obstruction of Bowels	...	...	1	...	2	1	...	4
	Intussusception, ...	...	...	2	2	3	1	1	9
	Stomach Disease, etc.	7	16	23	50	45	21	2	164
	Pancreas Disease, ...	...	...	1	...	1	...	...	2
	Hæmatemesis, ...	...	3	3	10	6	2	...	24
	Hepatitis, ...	2	2	4	5	4	2	...	19
	Jaundice, ...	...	1	1	1	8	...	...	11
	Liver Disease, ...	1	27	68	90	58	33	5	282
	Spleen Disease, ...	...	...	...	2	...	1	...	3
	Total,......	19	67	130	188	155	76	13	648
Order 5.	*Urinary Organs.*								
	Ischuria, ...	...	1	...	2	...	2	1	6
	Diabetes, ...	2	3	6	10	11	3	1	36
	Stone, ...	...	...	...	...	1	1	...	2
	Cystitis, ...	...	...	2	3	5	11	1	22
	Kidney Disease, ...	2	20	25	65	59	12	3	186
	Prostatic Disease, ...	...	...	...	...	5	6	1	12
	Bladder Disease, ...	...	1	...	5	25	24	7	62
	Hæmaturia, ...	...	...	...	...	1	...	...	1
	Addison's Disease, ...	...	...	1	...	...	...	...	1
	Stricture of Urēthra,	...	...	...	1	...	1	...	2
	Total,......	4	25	34	86	107	60	14	330

TABLE No. II.—*Continued.*

CLASS AND ORDER.	CAUSES OF DEATH.	AGE AT DEATH.							TOTAL.
		All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
III. Order 6.	*Organs of Generation.*								
	Ovarian Dropsy,	...	...	...	...	1	...	...	1
	Uterus Disease,	...	...	4	1	1	...	...	6
	Fistula in Perineo,	...	...	...	...	1	...	...	1
	Total,	...	...	4	1	3	...	...	8
Order 7.	*Organs of Locomotion.*								
	Arthritis,	...	...	...	1	...	1	...	2
	Joint Disease,	...	2	4	1	1	3	...	11
	Spine Disease,	1	1	...	4	2	2	...	10
	Disease of Foot,	...	...	1	...	...	...	...	1
	Total,	1	3	5	6	3	6	...	24
Order 8.	*Integumentary System.*								
	Ulcer,	...	...	...	...	1	...	...	1
	Pemphigus,	...	...	...	...	...	...	1	1
	Pyæmia,	...	1	3	1	2	1	...	8
	Total,	...	1	3	1	3	1	1	10
	Class III.—Total,	60	314	606	929	1019	661	141	3730
IV. Order 2.	DEVELOPMENTAL.								
	Childbirth,	2	5	4	..	...	...	...	11
	Phlegmasia Dolens,	...	1	...	...	...	...	...	1
	Total,	2	6	4	...	...	...	...	12
Order 3.	Old Age,	...	...	...	...	7	65	98	170
	Total,	...	...	...	...	7	65	98	170
Order 4.	Atrophy,	2	3	1	3	6	1	2	18
	Debility,	...	2	5	8	13	11	3	42
	Total,	2	5	6	11	19	12	5	60
	Class IV.—Total,	4	11	10	11	26	77	103	242
V.	VIOLENT DEATHS,	12	41	37	42	20	3	3	158
VI.	SUDDEN DEATHS,	...	4	4	4	3	5	...	20
VII.	CAUSES NOT SPECIFIED OR ASCERTAINABLE,	...	...	...	...	...	...	...	36

ABSTRACT OF TABLE NO. II., showing the number of Deaths caused by each class of Disease, and their percentage on the Total Deaths which have occurred since the SOCIETY was founded in 1815, to 31st December 1873.

CLASS AND ORDER.	CAUSES OF DEATH.	AGE AT DEATH.							TOTAL.	Percenta of Death caused b each Clas of Diseas
		All up to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.		
I.	**ZYMOTIC DISEASES.**									
Order 1.	Miasmatic, ...	50	120	136	154	125	65	20	670	11.894
Order 2.	Enthetic, ...	...	...	...	1	...	...	...	1	.018
Order 3.	Dietic, ...	3	12	17	8	3	1	...	44	.781
	Class I.—Total,...	53	132	153	163	128	66	20	715	12.693
II.	**CONSTITUTIONAL DISEASES.**									
Order 1.	Diathetic,...............	5	19	52	86	98	39	6	305	5.414
Order 2.	Tubercular, ...	62	135	116	78	31	5	...	427	7.581
	Class II.—Total,...	67	154	168	164	129	44	6	732	12.995
III.	**LOCAL DISEASES.**									
Order 1.	Nervous System, ...	23	101	199	274	309	231	46	1183	21.001
Order 2.	Organs of Circulation,	3	51	109	202	266	145	24	800	14.202
Order 3.	Respiratory Organs,	10	66	122	171	173	142	43	727	12.906
Order 4.	Digestive Organs, ...	19	67	130	188	155	76	13	648	11.503
Order 5.	Urinary Organs,......	4	25	34	86	107	60	14	330	5.858
Order 6.	Organs of Generation,	...	...	4	1	3	...	...	8	.142
Order 7.	Organs of Locomotion	1	3	5	6	3	6	...	24	.426
Order 8.	Integumentary System, ...	...	1	3	1	3	1	1	10	.178
	Class III.—Total,	60	314	606	929	1019	661	141	3730	66.216
IV.	**DEVELOPMENTAL DISEASES.**									
Order 2.	Childbirth, ...	2	6	4	...	...	...	...	12	.213
Order 3.	Old Age, ...	...	...	...	...	7	65	98	170	3.018
Order 4.	Atrophy and Debility	2	5	6	11	19	12	5	60	1.065
	Class IV.—Total,	4	11	10	11	26	77	103	242	4.296
V.	VIOLENT DEATHS, ...	12	41	37	42	20	3	3	158	2.805
VI.	SUDDEN DEATHS, ...	...	4	4	4	3	5	...	20	.355
VII.	CAUSES NOT SPECIFIED OR ASCERTAINABLE,..................	...	...	...	...	...	...	...	36	.640
	TOTAL OF ALL CLASSES,	196	656	978	1313	1325	856	273	5633	100.000

Part Second.

REVIEWS.

Notes and Observations on Diseases of the Heart, and of the Lungs in connexion therewith. By THOMAS SHAPTER, M.D., etc. London: J. and A. Churchill: 1874. Pp. 237.

EVERYBODY knows that in Morayshire the natives are apt to speak of events as having happened before or after the flood; not Noah's flood, however, for during that event they had no "coble o' their ain," as the Macleans of Coll were said to have had, but Dick Lauder's flood, which took place forty-five years ago. As Dr Shapter in his dedication speaks of a friendship which has lasted nearly fifty years, he must be, in the sense mentioned, an antediluvian, himself a relic—flotsam and jetsam—of these prehistoric days. We cannot, therefore, expect the same strict accuracy in physiology, pathology, or physical exploration, as we certainly look for in writers of a less ancient date. And this is so far fortunate, as we certainly do not find it. Indeed, after expunging all that we may nowadays safely regard as erroneous on these points, the result to the book is very much the same as that to the prickly pear in the hands of the missionary, who extracted all the prickles out of it—there is nothing left.

There is no organ of the body the diseases of which are capable of more easy or more accurate diagnosis than the heart; there is none in which want of precision in those essential elements on which our diagnosis must be founded is more fatal to accuracy. In the investigation of cardiac murmurs there are two elements of the utmost importance, rhythm and position of maximum intensity. Dr Shapter never once mentions the latter, except inferentially, as at page 45; while his ideas as to the former are so vague that he speaks of a protracted first sound or systolic murmur interfering with the audibility of the second sound; of a presystolic murmur being mistaken for a diastolic one, or the reverse; and of a presystolic murmur being confounded with a systolic one—all or any of which mistakes it is impossible to make, if due attention be paid to rhythm, as the murmurs referred to all occupy distinctly different periods of the cardiac action. They are also all of them so essentially different in the intrinsic qualities of the sounds produced, in their mode of propagation and position of maximum intensity, that, with proper attention to these points, it is impossible to make any mistake.

Dr Shapter believes in the active dilatation of the ventricle; this may be a venial offence; but it is not venial to state, as he does at page 141, that delay of the pulse is, or at any time can be, due to irregularity in the action of the two ventricles, the pulse being dependent on the systole of the left ventricle, while the cardiac impulse is due to the systole of the right ventricle. Nor is it a venial offence to regard hypertrophy as not the statical or mechanical result of valvular lesion, but an independent affection of probably coeval origin; or so to fly in the face of all cardiac pathologists as to declare that a presystolic murmur does not "absolutely imply vital unsoundness." But, indeed, when he sums up his conclusions in the last paragraph of all, that the only insurable cardiac affection is one revealed by a valvular murmur produced by "slight but not obstructive deposits on the valves;" he sums up with such a paradox as will effectually prevent any man, with the merest trace of reasoning power, pursuing knowledge further within his pages; for how is it possible for a deposit on a valve to give rise to a murmur, if it does not obstruct the opening in such a way as to form a fluid vein at it either during systole or diastole? We confess to a Hibernianism here, for how could any one be deterred from pursuing knowledge further by a blunder in the last paragraph? but we always read our books backwards, beginning with the last page: it saves time, shows whither the author tends, and thus enables us to devote more leisure to his language and his reasoning. It is wrong to judge others by ourselves, perhaps; but it certainly is not wrong to judge a work like that now before us from the present standpoint of physiology and pathology. The book is fluently written and pleasant to read, but that is of little consequence where accuracy is wanting, especially on such all-important points as those we have referred to.

Clinical Medicine. Lectures and Essays. By BALTHAZAR FOSTER, M.D., etc. London: J. and A. Churchill: 1874. Pp. 364.

THIS book is the record of honest work, such as Dr Foster may well be proud of; it is one which we can cordially recommend to the profession, and which may be read with profit and advantage by practitioner and student alike. By far the most interesting and instructive chapters in it are those upon Rupture of the Aortic Valves, on the treatment of Diabetes Mellitus, and on the use of ether in the treatment of Phthisis. The first establishes very clearly the diagnosis of the very serious accident to which it refers; it also points out, and we believe for the first time, the differential diagnosis between rupture of the mitral and that of the other segments of the valve—a refinement of diagnosis which has hitherto been impossible, the very lesion in the gross thirty years ago having been almost impossible of diagnosis. For then, instead of relying upon our more precise modern methods, our best auscultators were fain to supplement the very branch of diagnosis with which they were best acquainted by a reference to the condition of the pulse—a matter in which the widest discrepancies still prevail among all but our most experienced men. Further, he has shown the importance of the auscultatory phenomena, not only in diagnosis but in prognosis, and pointed out at least one effective reason why aortic regurgitation is occasionally so much more serious a lesion than it is at other times. A great deal of useful information is also contained in the chapter on the treatment of Diabetes, though all the possible modes of treatment, and even some of the most successful methods, have not even been alluded to; the Cannabis Indica, for instance, which is almost a specific for certain forms of diabetes, especially in old people. The chapter on the use of Ether in Phthisis, is also a most practical one, though modern pathologists might possibly object to the use of the term phthisis as vague and indefinite; still we all know what he means, and are thankful for any addition to those measures we employ to improve the general nutrition, and so ward off death. Some of the other chapters are not so practical; for example, we can put no confidence in his remarks on the use of the Cardiograph and Sphygmograph as diagnostic measures; not that we do not place implicit confidence in Dr Foster, but because the instruments he employs are in their present condition useless from want of accuracy, even for the hospital physician; and so troublesome of application, and so wasteful of time, that they would be of no use for the general practitioner, even were they more accurate. The only use of such instruments is to enable the hospital physician to determine with accuracy the precise value of those other means of diagnosis of which the general practitioner can avail himself; and if those instruments are themselves wanting in precision, the results obtained by their means are of course of no value. We have no hesitation in saying that the sphygmograph is in this respect utterly worthless, and that the use of the cardiograph is not worth the time it requires. More accurate modifications may still be attainable, but we must wait their production. The least satisfactory chapter of all is that on the use of Digitalis in Heart Complaint, for in it Dr Foster shows himself quite unaware of the actual effect of the drug on the heart. The whole chapter is fraught with errors founded on a mistaken idea as to this, but we may make this plain by a reference only to one cardiac disease. In aortic insufficiency, Dr Foster argues that the evil will be increased by digitalis, because, though the heart's action may by it be made more forcible, and the arterial tension increased, yet that these both tend to increase the regurgitation and augment the original evil. And so it would be if force of beat were all that the heart acquired from the use of digitalis; were its walls in diastole as lax as ever, the mischief would indeed be great. But death from digitalis is produced by spasmodic closure of the heart in systole, and that not the result of simply one over-active and too long-continued contraction, but the final effect of a gradually increasing tonic closure of the heart's cavities. The use of aconite in digitalis poisoning proves this: while the tonic contraction is still incomplete, aconite will relax it, and restore the proper equilibrium of contractility; once it is complete, aconite is in vain. It is proved also still more perfectly by the well-established sedative action of large doses of digitalis. If the action of this drug consisted solely in increased force of systole, how could this possibly produce any sedative action? But if it produce a gradually increasing tonic closure of the cardiac cavities, accompanied by a more forcible systole, then its sedative action is readily understood as dependent upon the diminished supply of blood, the result of tonic closure—a condition which is equally dangerous with that depending upon over-distention. This tonic closure of the cardiac cavities can now and then be very distinctly made out by percussion as regards the left ventricle in aortic regurgitation. So far, then, from digitalis being a drug to be avoided in aortic insufficiency with a tendency to asystole, that is specially the disease in which digitalis must be used with most freedom, though it must also be most carefully watched, because we are seeking to produce physiological effects which, though therapeutical within due limits, are highly dangerous, and may prove fatal if suffered to exceed what is absolutely required. Dr Foster, we think, very properly regards the diuretic action of digitalis as a fair indication of its tonic action, and believes that when the diuretic action ceases, the drug ought to be temporarily suspended. We think this is right; but Foster goes further, for he appeals to the sphygmograph in proof that the diuretic action of the digitalis depends upon arterial tension, while Lauder Brunton appeals to the same instrument as a proof of the reverse; this only affording a further proof of the untrustworthiness of the instrument referred to.

Principles of Forensic Medicine. By WILLIAM A. GUY, M.B., F.R.S.; and DAVID FERRIER, M.D. Edin. Fourth Edition. London: Renshaw: 1875.

THIS is a new edition of a well-known text-book, the popularity of which is daily increasing, so much so that it is seen lying alongside Taylor's well-known Manual in our Northern Criminal Courts. And deservedly so, as it presents in an elegant and readable form the leading facts of the science. It is customary nowadays, when a work reaches the third or fourth edition, for the exhausted author to seek assistance from some younger confrère, and the work is reproduced under their joint auspices.[1] In the present case the title-page awards equal honour to Dr Ferrier with the original author, although, after a careful comparison of the third with this issue, we fail to discover his claims to this dignified position. Little assistance is afforded by the statement in the preface, that 'where it was necessary to do so, the work of the original author has been distinguished by the letter G." This letter appears in the most confusing positions in the middle of pages, exhibiting not the slightest change since last edition, and leading one at first to suppose that the rest of the printed matter was the composition of Dr Ferrier. On closer examination it turns out that the presence of a "me" or "we" has determined the appearance of the letter. The arrangement is deceptive and confusing, and might have been avoided by the simple expedient of putting an "F" whenever the additions or emendations of Dr Ferrier justified its insertion.

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[1] Our copy of the second edition of Sir James Paget's well-known Lectures rs on the title-page that the work is "revised and edited" by Professor

In the most important addition to the work, and which forms an appendix to the chapter on Personal Identity, entitled "The Tichborne Case," it is a matter of doubt whether only those passages marked "G" are to be ascribed to Dr Guy or not. The first paragraph is so marked, and two notes have similar additions, while the whole article bears the impress of Dr Guy's style. No uncertain sound, however, is given in passing judgment on the celebrated case. "The medical evidence, taken as a whole, may therefore be pronounced to be in perfect keeping with the verdict which proclaimed the defendant to have perjured himself in claiming to be Roger Tichborne, and denying that he was Arthur Orton. If Roger was bled repeatedly in the arm (to say nothing of ankles and temple), if he had an issue on the left shoulder kept open for two or three years, and if he was tattooed as alleged, the defendant is not Roger. If Arthur Orton had the letters A. O. tattooed above the left wrist, and they did not exceed half an inch in diameter, the scar in this position—of the cause of which the defendant alleges utter ignorance—is quite *consistent* with the assertion that he is Arthur Orton; an inference strengthened by the existence of a second scar equally unexplained, and not seriously weakened by the difficulties already admitted, when fairly weighed against the evidence of the many competent and credible witnesses, who affirmed that the defendant sitting in court was no other than the Arthur Orton they had known at Wapping, in South America, and in Australia. This case has displayed in an unusual degree that conflict of evidence which has marked all cases of disputed identity; and it should be added, in justice to those who have become professionally interested in it, that what transpires in a court of law is not all that may be believed without the imputation of excessive credulity; that many statements calculated to impress the mind very strongly, are shut out from a court of law by technical rules of evidence; and that the unwise usage which allows the parties to a suit to choose their own skilled witnesses, is one calculated to throw doubts on the very facts which should be the least open to objection."

While we cordially agree with this, we are still of opinion that such an extended notice of this case (thirteen closely printed pages) is out of place in a work which professes to contain "only such illustrative cases as could for the most part be compressed into a narrow compass." Such a case as that of Tichborne may not occur for another century, and when it does, only experts will be called in to exercise their skill, so that to the student or the practitioner the present history has no practical interest. Had a page been devoted to the practical bearings of such cases as those of Palmer, De la Pommerais, and Madeline Smith, the student would be taught much concerning the symptoms and diagnosis of important poisons, and practitioners could be warned against mistakes in the conduct of toxicological cases. Nothing tends more to enforce rules than judicious reference to historical cases, and the memory at the same time receives important aid. Every intelligent medical student and practitioner ought not only to be able to tell what was the poison employed in each of the cases to which we have alluded, but also the cause of failure in the one case, and how a verdict of guilty was returned in the other two.

While the work has been carefully revised and such omissions as sneezing as one of the most important symptoms of the action of veratria and the use of a solution of the bichloride of mercury in corroboration of the presence of a sulphocyanide, have been supplied, we note that while the tests of digitalis are given minutely, no hint is given as to the difficulties connected with the separation of the alkaloid, and also that colchicine is dismissed in the sentence, "Toxicologically, colchicum and colchicina have been but imperfectly investigated," while cases are on record where this alkaloid was successfully separated by Stas's process, and its reactions obtained. We cannot help thinking, too, that the case of Madame Houet, related at p. 31, and that mentioned at p. 301, are the same. If not, the reference to the latter remarkable case should have been given. And surely this sentence inserted from the former edition should not have been repeated in the present light of science without alteration, "A fracture caused some time before death would be readily distinguished by the *inflammation* set up about it." If the work is to be used by lawyers, the index, which is scanty, must be enlarged so as to include such words as caput succedaneum and meconium, and such cases as Palmer, De la Pommerais, Smethurst, and Pritchard—possibly easily enough traced by medical men, but sought for with difficulty by non-professionals.

The West Riding Lunatic Asylum Medical Reports. Edited by J. CRICHTON BROWNE, M.D., F.R.S.E. Vol. IV. London: 1874.

DR CARPENTER begins this volume with an address on the physiological import of Dr Ferrier's experimental investigations into the functions of the brain. At the request of Dr Crichton Browne, he delivered this address before an annual medical conversazione, held a year ago at the West Riding Lunatic Asylum. Dr Carpenter tells that the time which he can spare from official duties has been much engrossed by other studies. This might have been a good reason why he should not have published his lecture; but since he has done so, we must view it as it stands. A great part is just what one will find in any ordinary book of physiology, and the whole thing has been put together with so little trouble, that, up to the time when he sent the MS. to the printer, Dr Carpenter had not read the paper of Fritsch and Hitzig on the Electrical Irritability of the Brain, and their investigations on the Physiology of the Brain, published in Reichert's and Du Bois Reymond's Archiv. He remarks, "It has been recently found that the application of a weak galvanic current to the cortical layer of the cerebrum calls forth movements;" and he adds in a note, "This was first ascertained by Hitzig in 1870, and the series of experiments, which he subsequently prosecuted in conjunction with Fritsch, led them to conclusions which anticipated those of Dr Ferrier to a greater extent than I was aware of when I delivered my address." The truth is, that in making this tardy discovery, Dr Carpenter should have rewritten part of his paper. The following passage, for example, is unfair to foreign physiologists:—

"At a time when we are hearing so much of our backwardness in scientific research, as compared especially with our German *confrères*, it is gratifying to reflect that the greatest advances in the Physiology of the Nervous System which have been made during the last fifty years, have been chiefly the work of British investigators. It was Sir Charles Bell who first established the difference between the *Sensory* and the *Motor* nerves; it was by Dr Marshall Hall that the *Reflex action of the Spinal Cord* was first distinctly demonstrated; Dr Waller, contemporaneously with MM. Claude Bernard and Brown-Séquard (the latter of whom is half an Englishman), defined the *Vaso-motor* action of the Sympathetic system; and to these must now be added Dr Ferrier, the remarkable results of whose experiments upon the brain it is my present object to discuss."

Here passing over the question of how much was done in observing the phenomena of reflex action by foreigh physiologists, Unzer, Prochaska, and others, and the contemporaneous claim of Müller, a subject with which Dr Carpenter is not unacquainted, it is time to call attention to the fact that Dr Hitzig has recently republished his researches upon the functions of the brain,[1] in which he complains of the way his own observations and those of Dr Fritsch have been passed over in Great Britain. Not only did these two observers find out that a galvanic current applied to the hemispheres denuded of their membrane called forth movements;

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[1] Untersuchungen über das Gehirn, von Dr Eduard Hitzig. Berlin: 1874.

but they indicated the motor centres for the muscles of the limbs, face, and neck, and laid down certain rules and plans of investigation, which were made use of by Dr Ferrier. The latter physiologist substituted the interrupted for the continuous current, which, in some cases, we think, was an improvement, though this is denied by Hitzig. There is no doubt whatever that the credit of entering on this new path of medical discovery belongs to Fritsch and Hitzig; and that Ferrier, although he has made some valuable observations, only followed their lead. There are many points of disagreement between their observations and those of Ferrier, which we cannot enter into here, and which we can scarcely expect to see decided at once; but it seems to us that Dr Carpenter should not have filled twenty-three pages without paying more attention to the literature of the subject.

We began to read Dr Ferrier's pathological illustrations of brain function in the hope that they would contain some striking confirmations of his well-known experiments; but although he has selected his examples from the case-books of the West Riding Lunatic Asylum, they do not seem clearly to illustrate his physiological views. Dr Ferrier remarks that they were not specially intended for publication, and are to some extent deficient in detail. It is common enough to have ill-reported clinical cases in well-written books; and, in the present instance, if the notes are sometimes deficient in detail, in other respects they are redundant. In publishing a case, all details not bearing upon the point it is intended to illustrate should be struck out. If a patient dies of small-pox, it may be worth while noting that he has one vaccine cicatrix on the left arm; but who cares about knowing this, if his disease be epilepsy? What is the use of reporting, "circulatory system, heart normal, respiratory system normal, cerebellum, pons, and medulla not found to be diseased," and so on? Is it not better to intimate at once that only the pathological lesions are described, and that the different functions and organs are assumed to be normal, unless the reverse be stated? Dr Ferrier, who can write very good English, should have taken the trouble to amend the language of these reports, instead of getting them copied out for the printer in their original roughness. The most interesting point in his paper is where, getting rid of his clinical cases, he explains some of the views which his experiments on monkeys and other animals have induced him to adopt. "The researches of Broca," he writes, "and the numerous confirmations of his observations which have been put on record, taken with the results of my experiments on monkeys and the lower animals, seem to me to establish the fact of a localization of the faculty of speech, and to explain at least the broad features of the pathology of aphasia. I have shown that the region which governs the movements concerned in articulation is that which is the seat of lesion in aphasia. The region is symmetrically situated in both hemispheres, each one possessing the power of originating co-ordinated movements of the lips and tongue in a bilateral manner. 'Broca's convolution' is usually described as being the posterior third of the inferior frontal convolution of the left hemisphere. It would be more in accordance with the facts of experiments on monkeys, as well as with the facts which have come under my own observation, to localize the speech-centre in the operculum (Klappdeckel), which is included between the ascending and horizontal limbs of the fissure of Sylvius, and which immediately overlaps the island of Reil. While 'Broca's convolution' is placed in the left hemisphere, the centre for bilateral co-ordination of the speech-muscles exist, as I have said, in both hemispheres. To this bilateral action of each centre is to be ascribed the peculiarity of loss of the faculty of speech without paralysis of the articulating muscles. For, as regards the mere muscular action, one centre is capable of carrying it on when the other has been disorganized."

According to Ferrier, the memory of words, the memory of complex movements of articulation, guided by impressions of sound, is situated in the same convolutions. In aphasia, the power of voluntarily using words to express ideas is lost.

"As both sides of the brain are symmetrical and work conjointly, the memory of words may remain in the right hemisphere after the occurrence of lesion in the left. The explanation of the loss of the faculty of speech is to be attributed to the unequal preponderance to the left hemisphere in the inclination of voluntary actions. The left hemisphere, like the right side of the body, is the leading or driving side, so that lesion of the left side is like the loss of the right hand. It requires long education to enable the person to accomplish with his left hand all the delicate manipulations of which the right hand was capable."—(P. 57.)

Stated briefly, Dr Ferrier's views concerning aphasia seem to be: The motor centres for the nerves going to the muscles used in speech are situated in the convolutions of the operculum, and either the right or left centres act upon the muscles of both sides; but the memory of muscular adaptation of the motions necessary to articulation is only on one side, and that, in most cases, on the left. The memory for the adjustment of the same muscles when used for a different purpose from that of articulation, as in mastication, seems to lie on both sides. Dr Ferrier accounts for aphasia with lesions of the right side of the brain by supposing that the memory of articulated words lay in that side, just as some individuals are left-handed, while the great majority of men are right-handed. The analogy between the right arm and the muscular organs of speech does not seem to us very strong. Men educate their right arm for some purposes more carefully than the left; but this is in actions which are habitually done with one arm only.

To call the right the driving side seems an unfortunate expression, since the bridle arm is on the left side. The specialization of function on either side diminishes in proportion as the double organs act in common. This is seen in the legs as compared with the arms, and when we come to the organs of articulation, such as the lips and tongue, we cannot put in exercise the one side without also using the other; hence it seems to us difficult to admit the memory of acts performed by muscles of two sides should only lie on one side. The analogy of paralysis of the right arm, such as it is, would only lead us to conclude that the act of speech should be rendered more difficult, not that it should be altogether impossible. We imagine that those who have with so much labour accumulated observations to show that the faculty of speech lies in the inferior frontal convolution, whether on the left or right side, will be by no means inclined quietly to allow Dr Ferrier to shift the speech-centre into the operculum—a tract of brain not very far off, but quite distinct and easily distinguishable.

Dr Ferrier takes occasion in the same paper to reply to the objections of Dupuy, Carville, and others, who have insisted that the motor results produced by stimulation of the hemispheres is purely owing to the condition of the electric current to the ganglia at the base of the brain, and, in our opinion, he does so with success.

Mr Herbert C. Major contributes some observations on the histology of the morbid brain. Although his paper bears the evidence of careful work, the author rises above the encumbrance of details, and presents his conclusions in a form which enlists attention. His observations are illustrated by three wood engravings. We copy the following conclusions which he has worked out:—

1. That in senile atrophy of the brain the nerve-cells throughout the entire depth of the cortical layer, and in all parts, are morbidly affected, although to a variable extent and in a different manner.

2. That in the large nerve-cells the morbid process in the great majority of cases is one of granular degeneration.

3. That in the smaller nerve-cells generally, and occasionally also, but rarely, in the large, the process is one of simple atrophy, without granular degeneration properly so called.

4. That the nuclei of the cells invariably participate in the diseased condition, and become the seats of granular deposits which lead ultimately to their destruction.

5. That at an early period the branches of the large cells are usually atrophied and destroyed to a greater or less extent, but exceptionally are retained up to a late period in the degenerative process.

6. That the condition of so-called hypertrophy of the cells (Rutherford, Tuke) depends on a peculiar transformation of some of the large pyramidal bodies, and is not confined to senile atrophy, being also observed in general paralysis, but in both is of exceptional occurrence.

The most common alteration in the vessels is a condition of dilatation. The nerve-fibres were generally found abnormally coarse and tortuous, and the neuroglia in a state of atrophy and degeneration.

Dr William T. Benham has an interesting paper on the Therapeutic value of Cold to the Head. His experiments are very ingenious, and tend to prove that the temperature of the interior parts of the brain is not easily affected during life by the application of cold to the scalp, and he is disposed to believe that no marked benefit results from cold applications to the head in brain disease.

The same author gives us an investigation on the Actions of Nicotine, conducted in the usual way by poisoning animals and observing the effects. The conclusion is novel. Dr Benham finds that death takes place from this drug through cessation of the action of the lungs, and that the action of the heart, so far from being diminished, is quickened and strengthened.

Dr Merson has made a careful investigation into the state of the urine in general paralysis, the principal result being that the quantity of phosphoric acid is notably diminished. By the way, if we need a word like "urinology" added to the other "ologies," it ought to be urology.

The subject of Cerebral Anæmia is well treated by Dr J. Milner Fothergill. His paper extends over fifty pages, but is very complete, commencing with the anatomy and physiology of the vessels of the brain, and ending with the treatment of cerebral anæmia. The paper is readable, and though it contains nothing particularly new, it is of advantage that the attention of the physician should be directed to a condition which is so common, so important, and which to a great extent is capable of relief from suitable medical treatment.

There are some ophthalmoscopic observations in acute dementia by Charles Alridge, M.B., which are all the more welcome that there are still many discrepancies between the results of those who have used the ophthalmoscope as an aid to the study of cerebral disease. We have also got a paper on a case of Recovery from Double Optic Neuritis, by Dr J. Hughlings Jackson, which contains useful practical advice; an article on Acute Dementia, by the editor; Remarks on the Hourly Distribution of Mortality, by Robert Lawson, M.B.; and an essay on Inhibition, Peripheral and Central, by Dr J. L. Brunton. These papers are all well worthy of attention; and though the present volume wants the novel interest given to that of last year, by the publication of Dr Ferrier's recent investigations, on the whole the serial is not only sustaining its character, but may even be said to be improving. Much of this result seems due to the editor, who, by assembling men round about him devoted to science, and by aiding, and in some cases guiding, their researches, has a claim to the gratitude of our profession.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LIV.—MEETING I.

Wednesday, 11*th Nov.*—Dr RUTHERFORD HALDANE, *President*, *in the Chair.*

PATHOLOGICAL SPECIMENS.

I. *Dr Littlejohn* showed—(1.) A HEART with a small AORTIC ANEURISM which had given way, causing instant death. The preparation had been sent by Dr Pirrie, Dundee, with the following particulars. The woman—a mill-worker, about 35 years of age—was in good health, at least made no complaint about herself, took a hearty supper, and went to bed. A few minutes after she was heard to snore rather loudly, and on her landlady hastening to see if anything was wrong, she was discovered to be dead. On dissection, the pericardium was distended with bloody serum, and the heart enveloped in a thick coagulum which had escaped from an aneurismal pouch the size of a chestnut on the left side of the aorta, which was dilated and atheromatous.

(2.) A similar preparation, in which the aorta presented several small aneurismal pouches on its anterior wall, one of which had given way by a small aperture. In this case also the patient was a female aged 40, who had never complained of any chest affection. She was in bed smoking a pipe, when her head was seen to fall on one side, and the respiration ceased. Death was instantaneous, without a struggle.

Dr Littlejohn stated, in reply to the President, that he had repeatedly met with this lesion as a cause of sudden death, and that, in the majority of cases, a distinct syphilitic history could be made out.

II. *Mr Lister* exhibited (1.) an ELBOW-JOINT from a lady 60 years of age, to show how freely an articulation might be dealt with under antiseptic management. In June of this year an operation had been performed for the removal of a small sarcoma over which the skin was freely movable, but which proved to be connected with the outer border of the olecranon and the adjacent part of the external lateral ligament. A considerable portion of the ligament was taken away with about half the breadth of the olecranon, including the articular cartilage. The edges of the skin were stitched together with the exception of an orifice left for a drainage tube inserted obliquely so that its deeper end passed to the opening in the joint—a procedure which without antiseptic treatment would necessarily have involved inflammation and suppuration of the articulation. The wound, however, healed quickly without the formation of pus, except that ten days after the operation about a minim of that fluid, imperfectly formed, was pressed out from under the skin, but only showed itself on one occasion. At the same time the absence of

irritation in the joint was sufficiently shown by the circumstance that the patient frequently took the arm out of the sling which supported the wrist and moved the joint freely. In the early part of September the joint remained apparently perfectly sound, but some weeks later the disease recurred and amputation was performed. The preparation showed the articular surfaces in a perfectly healthy state, and the gap in the external lateral ligament repaired by fibrous tissue of new formation.

Mr Lister also exhibited (2.) two PEDUNCULATED EXOSTOSES removed one from each side of the lower end of the femur of a child nine years of age. That on the inner side was so low down that it appeared probable that its removal involved opening into the knee-joint, and the operation would have appeared to the exhibitor unjustifiable without trustworthy antiseptic management. As it was, no disturbance had followed.

Mr Lister also showed (3.) TWO SPONGES used as the deeper parts of the antiseptic dressing in this case of EXOSTOSIS. The sponges, while valuable for maintaining the surfaces of the wound in apposition and checking oozing of blood, were also of importance as affording clear proof of the power of a watery solution of carbolic acid to extinguish the energy of septic ferments. For a sponge containing septic material in abundance was simply moistened with 1 to 20 carbolic acid lotion, and squeezed as dry as possible before application. Yet, though the blood and serum which oozed into the deeper parts of the sponge were so abundant as to displace all carbolic acid lotion, or dilute it so largely as to make it inoperative as an antiseptic, yet putrefaction did not occur, as must have been the case had the septic particles in the sponge retained their fermentative energy. An allusion was also made to some recent experiments of the exhibitor, which demonstrated that the septic material present in water is not in solution, but in the form of insoluble suspended particles.

III. *Dr Watson* showed—(1.) the OS CALCIS and ASTRAGALUS removed from a young gentleman suffering from old-standing disease of the os calcis. An exploratory incision showed that the disease was situated in the os calcis, and that it had invaded both joints between the os calcis and astragalus. Dr Watson had already shown a specimen where, in a child, he had performed a similar operation with a completely successful result. In the present case the patient had made a satisfactory progress hitherto, the consolidation restoring the parts so as to render the aspect of the heel quite normal.

(2.) Specimen of EPITHELIOMA removed from over the inner surface of the os calcis, internal annular ligament, and internal malleolus. The tumour was attached to the osseous surface, and the laminated surface of the bone was afterwards removed so as to secure the extirpation of the entire structures apparently involved in the disease. The disease was of the size of the cut half-section of a large orange.

(3.) A NEUROMA removed from an ankle-joint amputation. The foot was removed ten years ago. Recently the stump became so unb ably painful, that it was scarcely possible for the patient to sustain any weight upon it, and rendered the use of any artificial limb impossible.

(4.) The parts of a KNEE-JOINT removed from an adult to-day on account of old-standing disease of the articulation. The limb had since childhood been flexed at right angles, and on measurement was found to be an inch and a half shorter than its fellow. The operation was conducted in such a manner as to secure the removal of no more than was absolutely necessary of the osseous structures entering into the joint.

(5.) The osseous structures constituting the KNEE-JOINT of a young lad who for two years had been the subject of gelatinous disease of the knee-joint. In this case the extent of the osseous surfaces removed was as limited as possible, so as to secure, if possible, that no interference with the growth of the limb should result.

IV. *Mr Annandale* showed—(1.) one whole and two separate half TONGUES affected with epithelial cancer which he had removed by operation. His experience of the late Mr Syme's cases and his own early experience had convinced him that although the division of the jaw at the symphysis exposed the tongue in the best possible way for its removal, the use of the knife in dividing its base was objectionable, as the wound was very liable to give rise to blood-poisoning. He, therefore, now separated the tongue by means of the ecraseur, having first divided the jaw, and thereby exposed the organ; and the result of his last five cases had been most satisfactory, a complete recovery having followed the operation in all.

(2.) A preparation showing an EXOSTOSIS growing from the inner surface of the head of the ulna.

(3.) A large TUMOUR removed from the ilium.

V. *Mr Chiene* showed a PATIENT from whom, in consequence of a compound depressed fracture of the skull in the left anterior temporal region, he had removed, on the 4th of September 1874, portions of the parietal, frontal, and squamous portion of the temporal bones, exposing the dura mater to the extent of 2½ inches in one direction and 1½ inch in the other. The dura mater was uninjured. The pulsation of the brain was not observed at the operation, showing either that the brain substance was much bruised, or that a large clot of blood lay between the brain and the dura mater masking the pulsation. The patient left the hospital with the wound firmly healed on the 6th of October. A bony covering to the brain at the seat of injury has not yet formed—pulsation being distinctly visible over an area equal in size to a shilling. During his stay in hospital the temperature never rose above 99° Fahr.

VI. *Dr Craig* showed a WEN which had been preserved for some weeks in a solution of chloral hydrate of five grains to the ounce. It has retained its fresh appearance, and Dr Craig recommended surgeons to try the fluid as an antiseptic, and thought that it might be useful in preserving anatomical specimens. It was much cheaper than methylated spirit. His attention had been directed to the antiseptic properties of chloral hydrate by reading a paper by Dr Keen of Philadelphia.

COMMUNICATIONS.

I. *Mr Annandale* then read his paper, entitled ANTISEPTIC INCISIONS: AN AID TO SURGICAL DIAGNOSIS, which will appear in a future number of the Journal.

The President thanked Mr Annandale for his interesting and valuable communication.

Mr Lister fully endorsed what Mr Annandale had said regarding the value of antiseptic incisions in many obscure surgical affections. He had placed on record cases in which he had freely opened joints as an effectual remedial measure before suppuration had occurred, allowing of an escape of clear serum. He would refer to cases of doubtful tumours of the mamma, into which a preliminary incision could be made, the surface of the section examined, and, if necessary, a slice removed for examination. All doubt could in that way be removed, and the case treated accordingly.

Dr George Balfour referred to the case of supposed calculus of the kidney upon which Mr Annandale had cut down. The symptoms of calculus were very well marked in that case, and, as in the most recent case of excision of the kidney, no calculus could be detected previous to complete removal, it is possible that in this instance also the calculus was embedded in the substance of the organ. The woman's sufferings before the operation were unendurable, and only relieved by the constant use of opium. Since the operation she had been entirely free from pain, and expressed herself as very well satisfied with the results of the operation.

Dr John Duncan thought that in the diagnosis of tumours, surgeons must not be carried away so as to neglect a close study of their natural history. He had made an incision into a doubtful tumour of the mamma, and neither by examining a slice of the tumour with the naked eye nor with the microscope, was he able to come to a conclusion regarding its nature. Such preliminary incisions as recommended by Mr Lister, would not always give certain information.

II. *Dr Muirhead* read a paper by Dr Graham Steell, entitled NOTES OF A CASE OF ABSCESS OF THE LIVER, which will appear in a future number of this Journal.

The *President* thanked Dr Steell for the notes of this case. Acute hepatic abscess was rare in this country.

III. *Dr John Duncan* then read NOTE ON THE SUBCUTANEOUS INJECTION OF MERCURY.—The author related the results of his late experience in the Lock Ward of the Royal Infirmary. He had administered, at intervals of from one to three days, 1-16th of a grain of the bichloride or bicyanide of mercury in solution, subcutaneously. He believed that in this way the physiological action of the drug could be obtained, on an average, after ¾ of a grain to 1 grain had been administered. The secondary symptoms seemed to disappear more rapidly than when administered by the mouth. The patients were in no case unwilling to submit to the momentary pain, and in every case the local irritation was trifling. The posterior surface of th arm, and the interscapular regions, were the most suitable for injections.

The *President* thanked Dr Duncan for his communication.

Dr Littlejohn asked if the bicyanide and bichloride acted locally as irritants to the same degree.

Dr Duncan considered the bicyanide the less irritating.

Mr Lister took notice of the small quantity of mercury which affected the system when administered in baths.

Mr Chiene had watched the cases during Dr Duncan's absence from town in summer, and he bore testimony to the small quantity of the drug required to induce the physiological action, and to the willingness of the patients to submit to the treatment.

Dr Watson stated that his experience of the administration of mercury in syphilis was, that it did no good, but a great deal of harm. Syphilis left untreated by anything except local applications got as certainly well as measles or any other exanthem. To give mercury in measles would hardly be deemed indispensable by any one at the present day, but it would be quite as rational as to give it in syphilis. No doubt, the early symptoms of syphilis disappeared rapidly under the use of mercury, but only to return again, unless the mercury were continued throughout the whole period of the eruptive tendency. Dr W. wondered how many of the strenuous advocates of mercurial treatment ever watched a case of syphilis when no treatment was allowed to complicate its natural progress. He was sure, if they did watch a few such cases, they would cease to employ mercurials. It was the opportunity afforded in watching cases under syphilization which led him to these conclusions. Dr W. had no objection to mercurial applications to local lesions, such as the indurated chancres, or to condylomatous eruptions. The mercurial vapour-bath acted on this principle when no inhalation was practised, and, by its local effect upon the erupted surfaces, tended to hasten their disappearance. In cases of syphilis where mercury had been administered, serious so-called tertiary lesions did sometimes occur, and in these mercurials sometimes were required to overcome the evil results of their early administration. In such circumstances, Dr W. believed that the injections of the bicyanide of mercury, as recommended in Dr Duncan's paper, might advantageously take the place of the use of mercury by the mouth, especially in cases where the stomach was rendered irritable by the use of the drug. The bicyanide of mercury was best known to us in the shape of the toy called *serpents de Pharon*. Possibly in the case of the injection of the bicyanide in syphilis, this only needed a slight transposition of name to explain its action, behaving in the disposal of the germs of syphilis just as the redoubted serpents de Moïse in the instance of the magical imitations of the Egyptians.

Dr Cadell had seen mercury administered subcutaneously in Hamburg in 1868. In Christiania, Professor Boeck ridiculed the treatment. His own experience coincided with that of Dr Watson, that mercury was unnecessary in syphilis.

Part Fourth.

PERISCOPE.

To the Knowledge of the Minute Pathology of Abdominal Typhus—(These Researches are carried on at the expense of the Medical Department of the Privy Council). *A Preliminary Communication by* E. Klein, London.—Being obliged to interrupt for some time my researches regarding abdominal typhus, I will communicate here some of the results which I have so far been able to establish with certainty, especially those which relate to its earliest stages.

1. Sections through the hardened ileum of a person who died of abdominal typhus show that in the mucous membrane, and especially in the neighbourhood of Peyer's glands, an active absorption of peculiar organisms takes place, which are carried outwards into the lymph spaces and veins of the mucous membrane.

2. In the earliest case which I received for examination (reckoned seven days from the day on which headache first commenced), peculiar greenish-brown bodies, generally round, appeared in the lumen of the Lieberkühn's follicles. Their size fluctuated within certain marked boundaries: the largest ones were from two to three times the size of a human red blood corpuscle, the smaller ones from a half to a quarter this size. Where they lie together in thick groups, which is generally the case, they appear dark olive-green coloured. On the edge of such groups, and where the corpuscles lie detached, are numerous forms of division to be found, as kidney-shaped and biscuit-shaped. The same corpuscles appear also in the tissue of the mucous membrane, where they seem to be enclosed in the lymphoid cells of the adenoid tissue. The veins, and also isolated lymph spaces, contain numbers of these corpuscles. In the former they undergo a speedy double and quadruple division, in consequence of which they split off into still smaller micrococcian granules, generally greenish-yellow coloured, which even hang together in twos or threes, or in rosewreath-shaped chains, or in actual zoogloa. The micrococci finally stand in genetic connection with a mycelium, whose threads branch out, are apparently smooth, and of a greenish-yellow colour. (I have made similar observations in my essay on sheep-pox, communicated to the Royal Society of London, now in the press.) One finds the above-mentioned organisms, not only in the neighbourhood of the moderately swollen Peyer's glands, but also in parts of the mucous membrane which, to the naked eye, show no change except a slight general swelling, although under microscopical examination the follicles of the Peyer's glands in these regions are changed in a peculiar manner, afterwards to be described. Besides the above-mentioned organisms, one finds also

balls of greenish-yellow coloured micrococci, extending from the free upper surface through the epithelium into the tissue of the mucous membrane, but especially into Lieberkühn's follicles, and from thence into the lymph spaces which surround the latter.

3. In a somewhat farther advanced case (twelve days) I found an astonishingly great quantity of micrococci penetrating from the free surface into the tissue of the mucous membrane, as well as into Lieberkühn's follicles, and from thence into the lymph spaces and veins, and, indeed, even into parts of the mucous membranes which are situated somewhat farther from the swelled Peyer's patches, and which to the naked eye appear to be little or not at all changed. Where the micrococci are aggregated in thick masses, as in and round Lieberkühn's follicles, they appear of a yellowish-brown colour.

4. In a still farther advanced case (sixteen days) I was able to trace the same state of things, but the quantity of micrococci was less.

5. The follicles of Peyer's glands showed in the fifth case (seven days) a peculiar change which consisted in that the central region of the follicles (chiefly of those parts situated in the submucous tissue, sometimes also of those situated in the mucosa) is changed into a spongy body, so that its bloodvessels are surrounded by spaces whose wall consists of the adenoid tissue which surrounds the bloodvessels. The lymphoid cells of the adenoid tissue were changed into large granulated formations containing from two to five and sometimes more nuclei. The nuclei were very like the nuclei of endothelial cells. In many follicles I saw true giant cells. The above-mentioned many-nucleated cells appear to undergo an active division into single-nucleated formations. In the later stage (twelve days) the mucosa showed also similar changes: the lymphoid cells of the adenoid tissue are changed into coarse granular formations which contain either a large vesicular or a snared nucleus, or several such nuclei. Several of these cells possess a vacuole, in which are found two or three small round nuclei. Cells similar to the above-mentioned were to be found in the veins of the mucous membrane and of the submucous tissue, as well as in the lymph vessels of the latter. I shall reserve for future communications the consideration of whether these changes in the mucous membrane and in Peyer's glands depend directly on the existence of the above organisms in the mucous membrane, as might be expected from cases 2 and 3, or whether they are to be considered as changes depending secondarily on changes in the vascular system.—The Brown Institution, end of July 1874. Translated from the *Centralblatt*, No. 45, 1874.

J. ETZINGER *on the Digestibility of the Gelatine-yielding Tissues.*—The author proved, on the one hand, the action of artificial gastric juice upon tendon, cartilage, and bones; and, on the other hand, fed a dog, whose nitrogenous secretion had sunk to a constant low ratio through several days' hunger, upon substances prepared with these. The increase in quantity of the nitrogen, after the consumption of the substances in question, is the scale for measuring the amount used up by the body.

1. *Bones.*—Bone dust detached through rasping from the compact substance of the bones of oxen, dissolved abundantly in muriatic acid at 0·3 p. c. On the tenth day, digestion of 10 gm. of the powder, with in altogether 1200 ccm. of the diluted acid, only 1·83 gm. undissolved remained. What remained was richer in organic substance than the original substance, although there was also organic substance plentiful in solution. On the addition of pepsine (a glycerine product of the mucous membrane of the stomach) more organic substance was set free in consequence. The dog experimented upon showed, after having received 15·0 gm. of bones, an increase of urea to the extent of ca. 8 gm. daily. An absorption of lime from the bones could not be proved; on the contrary, the constituents of the urine showed a deficiency therein. The author thinks that the cause of this appearance lies in the diminished decomposition of the tissues of the body through the supply of gelatine. Phosphoric acid showed a small increase. Corresponding to this, the fæces passed during the feeding upon bones, contained 308·5 gm. of ashes—that is, a little more than the bones consumed.

2. *Cartilage* (cartilage from the ribs of a calf) gave a considerable solution in muriatic acid at 0·3 p. c., namely 24·3 p. c., and a much greater solution after the addition of pepsine = 74·9 p. c. After feeding with cartilage, the excrement contained only traces of it: the urinary secretion showed an increase of about 11 gm. after feeding upon 72·2 of dried cartilage (by 100° C.).

3. *Tendon* yielded but little to the action of 0·3 p. c. muriatic acid. On the eighth day of digestion, there was a solution of 12·05 p. c.; in the pepsine mixture, on the other hand, the tendon was seen after three days to be nearly all decomposed and in a state of solution—94 p. c. of it was in solution. After neutralization and evaporation the solution did not form any jelly mass. The ligamentum nuchæ of oxen showed similar results. On the tenth day of digestion it vanished entirely, except a very small proportion of it. The dog received, after several days' hunger, on one day, 367·1 gm. of tendon, on the next day, 360·3 gm., corresponding to 245·8 gm. of dry substance. In the excrement there remained only a rapidly disappearing small quantity of tendon to be found. The nitrogenous secretion of the urine rose to 21·2 gm. (the tendon contained 46·6 gm.).

Thus, all the gelatine-yielding tissues are capable of digestion and assimilation; in greatest proportion, tendons, then cartilage, and finally bone, from which less organic substance is absorbed, probably on account of its speedy passage through the intestinal canal.

In this way the behaviour of gelatine has been thoroughly examined. The author confirms the earlier statements of Frerichs and Kühne, to the effect that gelatine loses its property of forming a jelly through digestion with pepsine and muriatic acid.—*Centralblatt*, No. 45, 1874. E. SALKOWSKI.

THE TREATMENT OF INTESTINAL OBSTRUCTION.—Dr Battey, of Atlanta, Georgia, U.S.A., in a paper read before the *Atlanta Academy of Medicine*, recommends the use of warm-water enemata in all cases of intestinal obstruction, intussusception, feculent obstruction, and even strangulated hernia. The distending force of the water, he says, is sufficient to draw out or unravel any form of obstruction. He claims to have first shown that fluid injected per anum can be made to flow from the mouth not only on the dead but also on the living body. This, he says, proves that the treatment can be applied to an obstruction at any part of the intestinal canal. The method is safer than the use of purgatives (which Dr Battey very properly condemns), and is worth a trial, especially in cases seen early. Dr Battey's suggestions as to the mechanism of intussusception are very ingenious, and not at all unlikely to be true in many cases. The paper is published in the June number of the *Atlanta Medical and Surgical Journal*.

GASTROTOMY.—Professor Jacobi of New York has published a very interesting account of a case in which he performed the above operation for malignant stricture of the œsophagus. Life was prolonged for ten days after the operation. Death was attributed to "septicæmia from purulent infiltration of the subcutaneous and muscular tissues" at the wound. Dr Jacobi describes the operation as being easy of performance, and in certain circumstances, with proper antiseptic precaution, not necessarily dangerous to life. He has prepared a table of fifteen cases, including his own, in which the operation of gastrotomy has been performed. The longest period to which life had been prolonged was eleven days. One patient died twelve hours after the operation. Almost all the operations were for malignant disease.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By W. HANDSEL GRIFFITHS, Ph.D., L.R.C.P. Ed., Licentiate of the Royal College of Surgeons of Edinburgh; Librarian to the Royal College of Surgeons in Ireland; Honorary Member of the Ontario College of Pharmacy, etc.

[The author of these Reports will be glad to receive any books, pamphlets, or papers relating to Materia Medica or Therapeutics. They may be forwarded through the agencies of the *Edinburgh Medical Journal*.]

THE ELIMINATION OF DRUGS.—In the *Rép. de Pharm.*, 1873, and in the *Jl. de Thér.*, 25th February 1874, M. Bordier communicates papers on the teaching of Prof. Gubler, relative to the elimination of drugs. A drug begins to act therapeutically when it is deposited by the blood, either in the histological elements of the tissues, or in the secreting and execreting organs which open on a mucous surface. When a drug is administered by the mouth, it is subjected in its passage through the alimentary canal to the action of acids, alkalies, alkaline chlorides, oxygen, and sulphuretted hydrogen. It is then absorbed into the circulation, and subjected to the action of the blood, the albumen of which forms with insoluble salts, soluble albuminates. The albumen has the power of interfering with changes resulting from chemical affinity, and hence it is that acids, as gallic and tannic, can circulate in the blood without combining with its alkali. As a rule, a remedy is "masked" by albumen in the circulation, and only acts at its point of eliminating from the blood. Foreign substances introduced into the organism tend to rejoin their similars or analogues among the normal principles; sulphur, phosphorus, iron, etc., will tend towards sulphur, phosphorus, and iron respectively; sellenium will tend towards the sulphur of the body, and arsenic towards phosphorus. A drug cannot be assimilated when it cannot meet with its similar or analogue. Bearing in mind that a drug is eliminated by that channel in which it meets with its similar or analogue, a knowledge of the chemical composition of the secretions will afford us valuable information as to the sphere of evacuation of drugs; thus, we can predict that sulphocyanide of potassium, soda, and neutral salts, will be eliminated by the *saliva;* soda, fatty acids, neutral fatty bodies, cholesterin, resin, and ferruginous pigment, by the *bile;* neutral salts, acids, water, fatty matter, and ferruginous pigment, by the *urine;* casein, lactose, volatile fatty acids, butter, and neutral salts, by the *milk;* neutral salts, volatile and fatty acids, by the *perspiration;* and gases and vapours, by the *pulmonary exhalation.* Some substances, as arsenic, antimony, tin, bismuth, lead, mercury, silver, and gold, are found at their point of elimination in a chemical condition as yet unknown.

ACONITE IN HEADACHE.—Dr Fothergill advocates the use of aconite in congestive headache, attended with coldness of the extremities. Aconite dilates the peripheral bloodvessels, and thus relieves the congestion of the cerebral vessels.—*British Medical Journal,* 10th January.

ON THE ACTION OF FOOL'S PARSLEY.—Dr John Harley infers from his analysis of the so-called cases of æthusa poisoning that the symptoms described are in some wrongly, and in the remainder most unsatisfactorily, attributed to the action of *Æthusa cynapium.* He concludes from his observations that this is a harmless plant, does not contain the least trace of conia, and does not exert any therapeutic properties.—*St Thomas's Hospital Reports,* vol. iv.

AILANTHUS GLANDULOSA IN THE TREATMENT OF DYSENTERY.—M. Robert, the principal medical officer attached to the naval division of China and Japan, records the remarkable results he has obtained in the treatment of dysentery by the ailanthus glandulosa. He finds that in hot climates it gives results superior to those of ipecacuanha, calomel, and astringents, either with or without opium. The bark of the root is the part used; two ounces by weight of the bruised bark is infused in four ounces of water, and the infusion is filtered. A dessertspoonful of this is administered morning and evening for three days, great attention being given meanwhile to the diet.—*Archives de Méd. Navale*, and *New Remedies*, July.

THE THERAPEUTICAL EFFECTS OF ALCOHOL.—Prof. Binz deduces from his experiments that alcohol produces a threefold action. It diminishes the heat of the body, reduces putrid processes, and increases the action of the heart. As alcohol lowers the combustion, it diminishes the metamorphosis of the tissues, and hence decreases the urea and carbonic acid. Large and frequent doses of alcohol are necessary to maintain a lowered temperature in fever, but there are cases when the heart is weak, in which alcohol is a valuable antipyretic, while quinine is powerless.—*Journal of Anatomy and Physiology*, May.

ALCOHOL HYPODERMICALLY IN CANCER.—Dr Hasse injects pure alcohol, with one per cent. of ether added, into the *edges* of the growth. He believes that he thus obliterates the vessels, especially the lymphatics, which convey the infection, and causes atrophy of the growth. The pain occasioned by the injection is severe, but lasts only about two hours, and is relieved by ice-bags. The injections are repeated every eight to fourteen days.—*Medicinische Central Zeitung*, 18th February.

THE USE OF ATROPIA IN PHTHISICAL SWEATING.—Dr James M. Williamson places on record the result of some experiments which have been made with atropia in sixteen cases under the care of Dr A. H. Hassall, at the Royal National Hospital for Consumption, Ventnor. The sulphate of atropia is best prescribed in pill, with extract of gentian; watery solutions are not to be depended upon, for they soon spoil by keeping. The first dose should in no instance be larger than one-eightieth of a grain. The remedy controlled the perspirations more or less in the whole sixteen cases; the effect was direct and permanent in four; direct, but temporary, in four; beneficial, but transitory, in seven; and inadmissible in one instance. In many of the cases the sweatings had extended over a period of several weeks, and had resisted all the ordinary methods of treatment.—*Lancet*, 25th July.

BROMIDE OF AMMONIUM IN CATAMENIAL EXCESSES.—Dr J. K. Black of Newark, Ohio, states that an essential rule to be observed in the administration of this remedy is to give it at least ten days before the expected period. If given during the crisis it will do little, if any, good.—*Cincinnati Lancet and Observer*, May.

THERAPEUTICAL EFFECTS OF BROMIDE OF POTASSIUM.—In cerebro-meningitis; in hyperæmia of the brain from excessive mental toil, especially when accompanied by insomnia; in puerperal eclampsia; and in the convulsions which frequently complicate the diseases of children, Dr A. M. Ragland has found the bromide of potassium of great value. The following is the formula which he recommends:—

Potassii bromidi, . .	℈i.
Tincturæ gelsemini, . .	ʒi.
Tincturæ valeriani, . .	ʒij.
Syrupi simplicis, . .	℥ij.

To children under one year of age a teaspoonful of this mixture is given every hour until relief is obtained; it is then given less frequently.—*New Orleans Med. and Surg. Jl.*, May.

CALABAR BEAN IN THE TREATMENT OF TRAUMATIC TETANUS.—Mr John Cunningham records a case of traumatic tetanus occurring in a boy aged seven years, successfully treated by Calabar bean. For details, we refer to the *British Medical Journal*, 4th April. Mr Jalland attaches importance to the state of the pupils as an indication of the effect of the drug. He mentions a case of tetanus treated by Calabar bean, in which relaxation of the spasm was coincident with contraction of the pupil.—*British Medical Journal*, 11th April.

PHYSIOLOGICAL AND THERAPEUTICAL RESEARCHES ON THE MONOBROMIDE OF CAMPHOR.—This is the title of a valuable paper communicated by Dr Bourneville to the *Practitioner* for August. The following are the deductions drawn by Dr Bourneville, from about forty experiments, as to the physiological actions of monobromide of camphor:—It diminishes the number of beatings of the heart, and determines contraction of the bloodvessels of the ears and eyelids. It diminishes the number of inspirations. It lowers the temperature in a regular and constant manner. It possesses undeniable hypnotic properties, and seems to act principally on the cerebral nervous system. It does not seem that the medicament is got accustomed to; and its protracted use determines rather rapid loss of flesh in cats and guinea-pigs. With regard to the therapeutics of monobromide of camphor, Dr Bourneville summarizes M. Deneff's case, which was the first in which this drug was employed as a nervine sedative, and which was the first publication on the subject. He also calls attention to Mr W. A. Hammond's paper on Monobromide of Camphor in the *New York Medical Journal*, May 1872. Dr Bourneville has successfully employed this medicament in cases of insomnia, and he believes that it will prove of great service in the treatment of cases of sleeplessness due to cerebral hyperæmia. He gave it in cases of paralysis agitans, and the modification observed consisted in diminution of agitation and slight increase of sleep. In a case of chorea the monobromide of camphor induced comparative calm. His experience of this drug in epilepsy and hystero-epilepsy was also encouraging. The following is the formula Dr Bourneville now uses:—

Monobromide of camphor, gr. ij.
Sugar, q. s., for converting into dragées.

For subcutaneous injection, he recommends — monobromide of camphor 45 grs., alcohol 9 drachms, and glycerine 4½ drachms. The punctures should be watched over, and not more than 30 or 40 drops should ever be injected into the same situation.

TEST FOR CARBOLIC ACID.—Most of the tests which have been proposed for the detection of carbolic acid are fallacious or unreliable. Jacquemin has, however, lately devised a test which is very delicate, and which will probably be extensively used. An equal weight of aniline and then of hypochlorite of soda is added to carbolic acid, a deep blue solution of erythrophenate of soda results, and this blue colour is changed to red by acids, owing to the setting free of erythrophenic acid; the blue colour reappears on saturation with an alkali.—*Pharm. Jl.*, 25th April, from *Rép. de Pharm.*

CARBOLIC ACID IN CHEESY PNEUMONIA.—Prof. Tommasi gives a solution of one part of carbolic acid in forty of sweetened water in cases of cheesy pneumonia which have gone on to the formation of pulmonary abscess. Two very successful cases are recorded. The dose of the solution is half a gramme to a gramme at first.—*Gazzetta delle Cliniche*, 19th May, and *Lond. Med. Record*, 2d September.

PROPERTIES OF CHLORAL.—M. Faithorne finds that chloral hydrate when heated over a spirit lamp does not inflame. It dissolves carbolic acid, weakens the odour of it, and renders it more soluble in water. If it be mixed with glycerine, a crystalline substance will form in a few hours. If chloral hydrate be mixed with bichromate of potash, and warm nitric acid added, a blue colour will be produced which is changed to red by ammonia, to bluish-green by soda, and to blue by potash.—*Pharm. Jl.*, 24th January, and *Jl. de Pharm. et de Chimie*, January.

CHLORAL AND CAMPHOR.—Mr Lennox Browne communicates to the *British Medical Journal*, 7th March, his experience of a mixture of chloral and camphor as a topical application for the relief of pain. In every case in which he employed it he found that it afforded great relief, sometimes instantaneously. When equal weights of powdered camphor and crystallized hydrate of chloral are mixed, the mass becomes damp at first, and, finally, forms a syrupy fluid which is neutral to test paper. This mixture is soluble in alcohol and ether, but water converts it into a soft solid. When the mixture is to be applied, it is painted lightly over the part and allowed to dry. It may cause a sensation of tingling, but it does not blister.

CROTON-CHLORAL.—Dr Burney Yeo states that its effects vary greatly in individuals. In delicate females two or three grains may be sufficient for a dose, while ten grains may be required to produce effect in strong males. Dr Yeo recommends that in order to discover the tolerance of this drug in individuals, it should be given in small frequently-repeated doses.—*Lancet*, 31st January.

INHALATION OF ETHERIAL OILS IN THE TREATMENT OF CATARRH OF THE KIDNEY.—Dr Leopold Dittel records several successful cases. Inhalations of the etherial oil of pine were employed. The frequent micturition, pain, and sleeplessness were in all cases relieved.—*Schmidt's Jahrbücher der Gesammten Medicin*, 12th May.

EUCALYPTUS GLOBULUS AS A FEBRIFUGE AND EXPECTORANT. —In *Schmidt's Jahrbücher der Gesammten Medicin*, 12th May, is a paper by Dr H. Oeffinger on this subject. He uses the tincture and finds, with Dr Müller of Efringen, that, in intermittent fever, from 60 to 80 grammes, as a rule, will produce an antipyretic effect, but sometimes 120 grammes are required. Dr Oeffinger is convinced from his researches of the value of this remedy; he concludes that it is often useful where quinine fails, and that, as a rule, quinine will fail when tincture of eucalyptus fails. Eucalyptus leaves no unpleasant after effects.

PURPURA URTICANS FROM INHALATION OF "FRIAR'S BALSAM."— In the *Lancet*, 7th February, a case is recorded in which a man inhaled the vapour of a drachm of compound tincture of benzoin two or three times daily, for some organic disease of the larynx. One evening he was suddenly attacked by an eruption of purpura urticans over almost the entire surface of the body. Within twenty-four hours the eruption began to fade.

IODINE IN THE TREATMENT OF CONSTITUTIONAL SYPHILIS.— Prof. Zeissl is of opinion that preparations of iodine will cure the early symptoms of syphilis. In some cases a few mercurial frictions are requisite. Affections of mucous membranes of mouth and pharynx yield more rapidly to iodine than to mercury. Iodoform is a most valuable application in torpid syphilitic ulcers; and it may be given internally in two or three grain doses, in pills, for the relief of syphilitic neuralgia.—*Med. Times and Gazette*, 31st Jan., from *Wien. Med. Wochenschrift*, Nov. 1873.

IODIDE OF POTASSIUM IN THE TREATMENT OF ACUTE AND CHRONIC BRONCHITIS AND ASTHMA.—Mr W. H. Spurgin writes to the *British Medical Journal*, 5th September, that he has tried iodide of potassium in over a hundred cases of these affections with almost invariable success. He usually prescribes it with carbonate of ammonia, and, when the cough is very troublesome, with tincture of belladonna and ipecacuanha wine.

ON IPECACUANHA SPRAY IN WINTER COUGH AND BRONCHITIC ASTHMA.—Dr Sydney Ringer and William Murrell write on this subject in the *Lancet*, 5th September. The ordinary spray-producer was used, with ipecacuanha wine pure or variously diluted. The patient soon becomes accustomed to it, and inhales the spray freely into the lungs. In order to insure as far as possible the topical effects only of the spray, the patient should be directed to spit out and even to rinse the mouth at each pause in the administration. If this precaution is not adopted, sometimes enough is swallowed to excite nausea and even vomiting. A protracted inhalation may excite vomiting. As a rule, the patient at first will bear from twenty squeezes of the spray without nausea, and will soon bear much more. The inhalation should be used daily at first, and in bad cases twice or thrice in the day. In cold weather the wine should be warmed. Several cases are recorded in which this mode of treatment proved remarkably efficacious. In administering the spray, the patient should be directed to close his nostrils with his fingers and to breathe deeply.

MERCURY IN SYPHILIS.—In a pamphlet recently published, Dr R. S. Sisson has endeavoured to show from his experiments at the Royal General Dispensary that there is no cure for syphilis except mercury. He has also sought to prove that the anti-mercurialists do not withhold mercury in every case, and that even Fricke of Hamburg, in what he called a "non-mercurial" period, often employed corrosive sublimate baths.

Part Fifth.

MEDICAL NEWS.

AT the Annual General Meeting of the *Clackmannan and Kinross-shire Medical Association*, held in Dunfermline on the 30th of July 1874, the desirability of forming a Union of the Medical Societies in Scotland was considered, and a unanimous opinion expressed that such a union would be of great value to the profession. A Committee—consisting of Dr Duncanson, Alloa; Dr Strachan, Dollar; Dr Bell, Dunfermline; and Dr Farquharson, Tillicoultry—was appointed to consider what steps should be taken to promote such a union.

AT the Annnal General Meeting of the *Scottish Midland and Western Medical Association*, held in Glasgow on the 30th of July, a motion, of which notice had been given at a previous meeting, "that the Society should be formed into a branch of the British Medical Association," was discussed; when it was unanimously agreed that it would be more advantageous to form a separate Association for Scotland. A Committee—consisting of Dr Naismith, Hamilton; Dr Moffat, Falkirk; Dr Strachan, Dollar; Dr Goff, Bothwell; and Dr Fairless, Bothwell—was appointed to take whatever steps they may consider necessary to promote an Association to be called THE SCOTTISH MEDICAL ASSOCIATION.

Objects.—The formation and maintenance of a bond of union amongst the members of the Medical Profession in Scotland. The elevation of the standard of their attainments, status, and emoluments. The defence of their just rights and privileges. The cultivation of social intercourse, and the advancement of medical, surgical, and sanitary science.

Rules as to membership, executive, and subscriptions, will appear when the scheme has been more fully considered.

THE "ANSTIE MEMORIAL FUND."—*General Committee:* George Johnson, M.D., F.R.S., 11 Savile Row, *Chairman;* J. S. Storr, Esq., 26 King Street, Covent Garden, *Treasurer;* and a large and influential Committee. *Hon. Secretaries:* R. Brudenell Carter, F.R.C.S.; Wharton Hood, M.D.—The death of the late Dr Anstie, which took place on the 12th of September, in the forty-first year of his age, was occasioned by blood-poisoning, received probably through an accidental wound in the course of a post-mortem examination, while he was engaged in investigating the nature and causes of an obscure disease which had destroyed the lives of some of the children in the Royal Victoria Patriotic Asylum at Wandsworth. A few days later, on the 23d of September, a meeting of some of his professional and private friends was held at the house of Dr George Johnson, F.R.S., 11 Savile Row; and at this meeting it was resolved—"That, considering the labours of the late Dr Anstie for the promotion of science, and the circumstances of his untimely death, it is desirable that some permanent memorial of his career should be established."

Dr Anstie has left a widow and three young children (a son and two daughters). He had not failed, by insurances and other proper and prudent means, to make provision for the actual maintenance of his family; but time in which to do more than this was not afforded him. The life of a London physician, up to his fortieth year, is usually one of expenditure rather than of gain; and Dr Anstie's estate, when invested as a source of income, will not procure for his children any approach to the educational and other advantages which they would have enjoyed if he had been spared to them. Under these circumstances, and in accordance with a wish very generally expressed, the executive committee have decided to recommend that a small portion of the sum subscribed, say about twenty pounds, shall be expended in the erection of a tablet or other memorial in some suitable place; and that the residue shall be deposited with trustees, to be by them applied to the education of the children, or to their advancement in life, in such a manner as circumstances may render expedient, and in accordance nearly as possible, with the wishes which their lamented father would have entertained for them. A proposition to this effect has been submitted to Mrs Anstie, and has received her approval and acceptance.

In the medical profession, Dr Anstie was as widely known as he was warmly beloved; and the Committee entertain no doubt that a large number of practitioners will be anxious to embrace this opportunity of testifying to the affectionate regard in which his memory is held, and to the value of the scientific work which he has done, and from which he has been so early called away.

Besides his distinguished merit as a physician, Dr Anstie did good service as a practical philanthropist. He died a victim to the insanitary state of a public institution; and on all these grounds it is felt that the public may gracefully and rightly combine with the members of his own calling in an endeavour to mitigate, in such small degree as may be possible, the effects of the irreparable loss which his orphans have sustained.

Subscriptions may be paid to the credit of the Anstie Memorial Fund, at the Bank of Sir S. Scott and Co., Cavendish Square; to the Treasurer, J. S. Storr, Esq., 26 King Street, Covent Garden, W.C.; or to either of the undersigned, to whom also any inquiries relating to the matter may be addressed.

R. BRUDENELL CARTER, 69 Wimpole Street, W.
WHARTON HOOD, M.D., 65 Upper Berkeley Street,
Portman Square, W., *Hon. Secs.*

LONDON, *October* 1874.

CORRESPONDENCE.

To the Editor of the Edinburgh Medical Journal.

SIR,—I trust you will permit me to reply very shortly to the remarks of Professor Balfour regarding the relations of medical degrees and diplomas, which appear in this month's number of the *Journal.* I shall ignore any previous correspondence on this subject, and will, to save time and space, address myself solely to Dr Balfour's statements. I have, firstly, to object to Dr Balfour's observation that "a degree of M.D. is higher than a diploma;" and I am unable to perceive the grounds, legitimate or otherwise, upon which the Professor's assertion is based. He undoubtedly tells us that the "*preliminary* and *scientific* requirements" for the degree "are, or ought to be, higher" than those required for the diploma or licence. But do facts bear out and support this latter statement? Let us set aside purely *scientific* degrees. These necessitate a special scientific training, and should not in any sense be employed or mentioned in comparison with *purely medical* degrees and diplomas. Confining the argument to degrees in medicine as compared with college licences, we find that the course of study for a diploma embraces the same classes—*minus* natural history and botany—as those required for the degree. The "*preliminary* and *scientific* requirements" of Dr Balfour must, therefore, be constituted by these two extra classes; and in this fact lies, to my mind, at once the moot point in his argument, and the alleged superiority of the degree. Now, Sir, can three months' attendance upon the classes of natural history and botany—in which time it is possible to gain at most only the rudiments of either science—be considered substantial grounds for asserting that the graduate must necessarily take a higher rank in social and professional life than the diplomate? I can hardly think that on this ground alone the former can so greatly excel the latter; nor can I perceive the influence, favouring or otherwise, which the rudimentary knowledge of biological science can exert over the future professional life of the medical graduate. Will a knowledge of botany and natural history make him a better surgeon, a more reliable physician, or give him a higher social position than the diplomate? I say not a word *against* the acquirement of such knowledge—that, in itself, is creditable enough; but when vaunted as part of an education of alleged superiority over an extra-mural curriculum of more *practical* nature, the argument cannot hold its own in any respect. I do not expect that even Dr Balfour will claim for the professorial teaching a higher standard than that of the extra-mural school. To do so were to weaken his own cause, since the University Medical Chairs are generally filled by men who have been extra-mural teachers in the first instance. And, admitting the identity of the University and College courses of study in all respects—save in natural history and botanical teaching—it still remains for Dr Balfour to show wherein the superiority of the requirements for the degree are higher than those required for the diploma. The *medical* student casts his botany and zoology to the winds after his first professional examination is passed. This assertion is demonstrable beyond doubt; and it is indeed difficult, or even impossible, to conceive in what way these extra classes can operate to the laudation and elevation of the *medical* degree, in the ultimate history of which these sciences have no part.

Professor Balfour claims for his graduates that they are the men who "advance science." Surely the Professor cannot mean by this to exclude non-graduates from the fields of scientific discovery; and yet his tone reads exclusive enough in its character to warrant such a supposition. If graduates alone are supposed to be capable of being scientific pioneers, what are we to think of the labours of such men as Syme and Goodsir, Owen and Huxley, who were and are not graduates, save in an honorary sense? Many scientific discoverers—nay, most—have come to their work, not from the universities, but from college and extra-mural lecture-halls. That Dr Balfour should select "a graduate of the University of Edinburgh" to fill any "important scientific position," is not to b wondered at. We give gifts to our own before we think of others; but here again an exclusive tone predominates; for to assert that graduates are qualified over others to accept such positions, is a statement to which the facts I have previously urged in this letter form a conclusive answer and denial.

The elevation of the graduate partakes thus far too much of the nature of an invidious distinction, to meet with sympathy or support even from the graduate body at large. University degrees and honours no one may lightly esteem, far less depreciate; but to unduly elevate these, to the depreciation of the diploma, is a very unwarrantable and gratuitous task. The diplomate possesses equally with the graduate, in virtue of his curriculum and examinations, an honest guarantee of his ability to practise medicine and surgery in as scientific a manner as can be desired or obtained. To argue otherwise, were to endeavour to lower the estimation in which the majority of hard-working practitioners in Britain and her colonies are held. And if the proposal to make botany and natural history parts of extra-professional education be carried out, the University curriculum will then only the more nearly approach the extramural course in its nature—and, let us hope, in its results also, so far as turning out practical workers is concerned. Let me, lastly, advise Dr Balfour to consider carefully such important matters as these ere he writes to the public concerning them. Haste in such matters is very proverbially connected with a slow rate of progress. And, finally, let me also state the point in which the gist of the whole matter lies, which point I would recommend for Dr Balfour's consideration—it is not the degree or diploma that makes the man honourable; it is the man that ennobles or dignifies the qualification, of whatever nature that qualification may be.—I am, Sir, obediently yours, BIOLOGIST.

UNIVERSITY GRADUATION.

To the Editor of the Edinburgh Medical Journal.

SIR,—Perhaps you will permit me, as an impartial observer, to make a few strictures on Professor Balfour's remarks on "University Graduation;" which appeared in the *Edinburgh Medical Journal* for November.

The Professor, with indigenous caution, states that his remarks were "hurriedly written," feeling conscious, no doubt, that he was laying himself open to more or less adverse criticism. And though he writes from a conviction based upon an experience of more than a quarter of a century, he must bear to be told that that conviction cannot be accepted without further inquiry. It is just the greater reason why his opinions should be well sifted; for, as a rule, professors are like other men, apt to run into a certain groove, and to be much benefited by gentle and wholesome reminders.

That a University degree is an honourable distinction is clear enough, and I presume that no one doubts this; but it is equally clear that the Professor, in his haste to defend himself and his colleagues, has overestimated both. Supposing that the "preliminary and scientific requirements"—which mean the amount of matter committed to memory—are actually higher for a degree than for a college diploma, what of that? Do those requirements guarantee future distinction?

The M.D. is certainly not essential for practice, but the majority of M.D.'s *do* become "mere practitioners," without attaining a "higher position," however much they may assume. Of course, we all "look to our graduates as men who are to advance science," but not to them alone; and, if I mistake not, our most distinguished naturalists at the present day are neither graduates of Edinburgh nor of any any other University. The distinguished botanist must have given way to a paroxysm of "alma mater" affection when he uttered the hasty remark that if he "wanted a man to be chosen for an important scientific position," he "would select a graduate of the University of Edinburgh." What would Sir Dominic Corrigan—who is prepared to show by statistics that most of the successful competitors for the public services of late years have all hailed from Dublin—say to this?

Now, as to the "absurd" idea of examining on certain prescribed standard works, as recommended by the *Old Practitioner*, I am sure that most thinking men will agree that he (the *Old Practitioner*) has handled his subject in a masterly and impartial manner. He has, in fact, taken a comprehensive and common-sense view of existing evils, and writes like one who has moralized over the folly of compelling candidates to commit unnecessary details to memory, which are invariably forgotten for ever a few months after their examinations are over. This is the true source and cause of cramming; and so long as young men under twenty-five years of age are expected to exhibit a competent knowledge of several very extensive subjects, each of which requires a lifetime for an ordinary intellect to master thoroughly, there *will* be cramming, and the stiffer the examination, the more will candidates resort to all sorts of devices to meet the "catch" questions of unfair examiners, a procedure perfectly natural and quite justifiable on their part.

One does not require to be either a professor or an examiner to understand all this; and it would be charity in the extreme to suppose that every man who presents himself for a degree intends devoting the remainder of his life to the study and advancement of science. Such disinterested individuals are few and far between, notwithstanding the "number of students who spend their time in the Botanic Garden and Museum during the summer and autumn." If these gentlemen do so solely from a desire of acquiring a thorough knowledge of botany, they deserve every credit; but if they are going to be successful and useful members of the healing art, apart from being "mere practitioners," I would advise them to study the "book of nature" elsewhere.

The importance which Professor Balfour attaches to his remarks culminates in his asking one question—a very significant one—which he evidently thinks a poser. I shall conclude by answering it, and also by asking one or two questions, which if he can answer satisfactorily, in any but a negative sense, he shall have my best thanks.

His question runs thus: "If a student cannot examine a plant which he never saw before, and give some opinion on it, and description of it, what is the use of teaching at all?" This is what comes of thirty-three years' experience as an examiner! Mark what a simple answer it requires: Any student of ordinary capacity, who studied botany from books and by cramming, together with his own exertions in the field, could, independently of academical aid, readily give a description of, and some opinion on, a plant which he had never seen before; but to apply such a test would be taking an unfair advantage of a man who had other subjects to study at the same time.

I shall now put a question which I consider a much fairer one, if not more suggestive. On what rational grounds are men dubbed Masters of Surgery before they have performed a capital operation on the living body, and why should the same men be kept for two years as probationers before receiving their M.D. diplomas? and, further, how many graduates on their capping day could, if they were taken into an anteroom and set down to an examination equally searching to those they had previously passed in Anatomy, Physiology, Chemistry, Natural History, Botany, Latin, etc.—how many, I ask, would come up to the required standard? There is no getting out of this—either all could pass, or all could not. Now, to my mind, if all retained the knowledge they had previously acquired, there would be some real intrinsic value in their degrees; but every man of sense knows perfectly well that such is not the case; and if so, what is the use of all those searching examinations?

All admit that it is essential to test the fitness of young men before they are allowed to practise upon their fellow-beings, but such a test is not necessary for inducing men to study science, and produces very little effect in advancing it. If there were no examinations at all, we should have exactly the same number of eminent men we have got at the present day. The real advancers of science have both the inclination and aptitude for work inherent in them, and may be safely left to themselves. I hope to see the day when there will be a complete revolution in professorial duties, when they will be limited to their proper sphere—that of teaching only—and paid by the State or out of a common fund. Then Universities will be what they ought to be—open to all, independent of the mystical "annus medicus," which appears to be a *sine qua non* for an Edinburgh degree; and degrees will be conferred upon those only who have actually done something towards the advancement of science.—I am, Sir, your obedient servant, A COUNTRY PRACTITIONER.

Erratum in the November number of the Journal.—On page 414, fourteenth line from the bottom, *for* £1733, *read* £1831.

JUN 1969

WESBY

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